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THE UNIVERSITY OF HONG KONG

THE EFFECT OF CHINESE CULTURE ON THE IMPLICILT VALUE OF GRAVEYARD VIEW IN HONG KONG RESIDENTIAL PROPERTY MAKET

A DISSERTATION SUBMITTED TO THE
DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
IN CANDIDACY FOR THE DEGREE OF
BACHELOR OF SCIENCE IN SURVEYING

BY
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HONG KONG
APRIL 2005

Declaration

I declare that this dissertation represents my own work, except where due acknowledgment is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed: _____

Name: _____

Date: _____

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ABSTRACT

In this research, the author has employed hedonic price model to study the effect of graveyard view on Hong Kong property prices. Although graveyard view is not an observable tangible variable on property prices, results generated by varies models in this research confirm graveyard view has a negative impact to the property prices. By the time trend analysis, it shows that graveyard view brings a larger degree of penalty to property price during boom period than slump period. When people are wealthier, they tend to avoid living in a graveyard view amenities. It matches with the phenomenon that well-educated people are not willing to enter a career related to death. With choices, Chinese people reject anything related to death in their daily life.

The author explains the penalty of graveyard view by the psychological effects it carries. The effect should be more significant in Chinese societies because of traditional Chinese religious belief, such as uncertainty after death. One of the psychological effects created is stress. Stress causes burden to people's health. Hong Kong people already suffer from a lot of stress everyday. Graveyard view exerts extra stress on them. In this way, one can know that why graveyard view causes burden to tenant's health. Viewing at another angle, in an area with dominant ethical Chinese, most of them are superstitious and they believe graveyard view brings adverse effects to the tenants. Although there are still small amount of non-superstitious in Hong Kong, the effects stand still. It is because purchasers are still dominant by ethical Chinese. It reduces the resale power of a graveyard view amenities. Therefore, all buyers require penalty when purchasing graveyard view properties. The results implies that appraisers, town planners and developers in Hong Kong have to take the negative impact of graveyard view into account when considering graveyard view amenities.

Apart from the graveyard view variable, the author finds that the effect of age, size and lucky floor contradicts with previous literatures. The results suggest that improvement of the community's faculties and transportation network may have

positive effect to the property price, which is being captured by the one of the independent variables (AGE) in this study. The contradicting results of size between two estates and the insignificant result of lucky floor in Riviera Garden suggest that the preference of some housing traits change accordingly to different people's financial status.

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CHAPTER ONE

1.1 Background

Hong Kong is a small and congested place with rapid population growth. The population of Hong Kong has reached 6.8 millions with a positive growth rate each year.[1] The limited supply of land together with the high consumer price index causes Hong Kong property price much higher than many others developed countries, standing near the top of the world. People regard purchasing residential apartment as the most largest and important investment in their life. Some people even purchase properties for speculation. As properties are expensive and important to many Hong Kong people, the effect of graveyard view is worth studying.

Being a colonial of England for 99 years, Hong Kong becomes a special place with the presence of both Chinese and Western culture. Johnson (1985)[2] comments the image of Hong Kong is essentially urban and westernized. In contrast, Lip (1995)[3] argues that Feng Shui is among the universal elements in Chinese culture, found in People Republics, Hong Kong, Taiwan, Singapore and overseas Chinese communities[1]. From Lip prospective, it is not difficult to see the importance of Feng Shui among all Chinese societies around the world.

The author has chosen Hong Kong as a place to study the effect of graveyard view on residential property prices. There are several reasons behind. Firstly, although Hong Kong is a modern city, superstition is still very common in their mind. They believe that Feng Shui would affect their luckiness. The effect of Feng Shui in Hong Kong is more significant than other cities in the world. Furthermore, the active

[1] Department of Health, HKSAR (2003), "Department of Health Annual Report 2002/2003", Hong Kong : Department of Health. of Health, HKSAR.
[2] Johnson, D. (1985) Regional Operas and Their Audiences: Evidence from Hong Kong. "Popular culture in late imperial China". Berkeley : University of California Press. pp 161- 187.
[3] Lip, E. (1995) "Feng Shui : Environments of Power : a Study of Chinese Architecture", London: England: Academy Editions.

transaction history of residential property market favors the study. All in all, Hong Kong becomes the best place to carry out this study.

Nowadays, some people percept Feng Shui as a kind of Art. For example, a foreign architect, Norman Foster, designs the original design and planning of Hong Kong and Shanghai Bank. However, the design was subjected to changes according to the suggestion of geomancer. The circulation routes and structural elements were changed in order to get the best benefits from Feng Shui.[4] Furthermore, its beautiful architectural design is also famous worldwide. Feng Shui becomes an integral part of a property. In Hong Kong, villagers may object to any new government building project on the grounds that its construction would alter the delicate balance of relationships in the environment, thus affecting their luck.[5] They believe good Feng Shui properties bring fortune to the tenants while bad Feng Shui properties bring burden.

Tse and Love (2000)[6] regard lucky floor numbers as an intangible attribute because it does not bring any immediate benefits to one being. Same theory applies to graveyard view as well. Graveyard view has no observable tangible effect to the tenants. In fact, graveyard view is regarded as open view and even beautiful scene in some foreign countries. However, graveyard view has significant counter impact on property prices in Chinese societies. Chinese culture is very distinguishable from other country's culture. In this dissertation, the author is trying to investigate above phenomenon on behalf on Chinese culture, for example, how Chinese people percept death.

By using regression model and carrying out analysis, the effect of graveyard view on property prices would be studied. Emphasis will be put on the significance of their effect brought by the Chinese culture.

[4] Lip, E. (1997) "What is Feng Shui?", London: England: Academy Editions.
[5] Adams, G. (1992), Games Hong Kong People Play: A Social Psychology of Hong Kong Chinese"
[6] Tse, R. Y. C. & Love, P. E. D. (2000), Measuring residential property values in Hong Kong, "Property Management", 18, 5, pp. 366-374.

1.2 Objectives

The major objectives of this study include:

- To investigate Chinese culture and explain how graveyard view affect ethical Chinese people's health in a psychological way
- To identify the main determinants of property prices in Hong Kong
- To access the relationship of major determinants and property prices by constructing a hedonic pricing model
- To test whether graveyard view brings penalty to property prices in Hong Kong
- To test whether the penalty of graveyard view would increase or decrease significantly during boom and slump period
- To interpret the findings and draw appropriate conclusion
- To provide a general framework for further research on how other cultural factors affect property prices in area with different cultural backgrounds

1.3 Structure of the dissertation

This paper is organized into five main sections. In Chapter 2, focuses would be put on the review of relevant literature of the research model and the hedonic price theory. Chapter 3 concentrates on the how Chinese cultural believes affect tenant's behavior when considering a graveyard view property. The investigation would go in depth by concerning the psychological effect generated from superstition and cultural believes. Before mentioning the method of data collection and the way of processes selected data in Chapter 5, background information about Hong Kong property market would also be reviewed in Chapter 4. The research model is presented in Chapter 6 and 7. Details pertaining to the selection of independent variables and functional form and the tests employed are discussed. Chapter 8 reports the empirical results and discusses the findings generated from those models while Chapter 9 concludes the study.

1.4 Importance of this Study

There is numerous empirical studies aim at finding out the relationship between the attribute preferences to the property prices. Most of them focus on the effects of dwelling specific attributes, location, MTR stations, pollution, etc. Studies carried out to investigate the effect of graveyard view on property prices are rare. Ho (1999)[7], Tse and Love (2000)[8] show that graveyard view brings penalty to the property price. Chin et al (2004)[9] has carried out a study to find out the effect of graveyard view in Penang, Malaysia. Chin et al proved that the penalty of graveyard view amenities is more serious during boom period than normal or slump period in Malaysia. One can expect that the cultural belief would bring penalty to the property price once the group of superstitious traders reaches a critical mass, and the effects would be even magnified during boom period. However, is it applicable to other areas in the world that is also dominated by ethical Chinese? It has not been studied before. Therefore, the author would like to focus on the effects of Chinese cultural belief on the property prices, especially its effects in boom and slump periods[10].

Although there have been studies showed that graveyard view has a negative impact on the property price and lucky floor numbers contribute benefits to the property value, focuses seem shifted to the results. The rationale behind has not yet been comprehensively investigated. It left a field for exploration. Many literatures explained the phenomenon by Feng Shui belief in Chinese Society. In the author's view, it is not that simple. Apart from Feng Shui, it is also a matter of culture and psychology.

The author would like to extend Chin et al (2004)[11] study of Penang to see

[7] Ho, H. W. (1999), "An Empirical Study of the Impact of Views on Apartment Prices", Department of Real Estate and Construction, unpublished.
[8] Tse, R. Y. C. & Love, P. E. D. (2000), Measuring residential property values in Hong Kong, "Property Management", 18, 5, pp. 366-374.
[9] Chin, T. L., Chau, K. W., Ng, F. F., The Impact of the Asian Financial Crisis on the Pricing of Condominiums in Malaysia, "Journal of Real Estate Literature", 12, 1, pp. 33-49.
[10] The study is based on the assumption that the critical mass of ethical Chinese in Hong Kong has been reached.
[11] Chin, T. L., Chau, K. W., Ng, F. F., The Impact of the Asian Financial Crisis on the Pricing of Condominiums in Malaysia, "Journal of Real Estate Literature", 12, 1, pp. 33-49.

whether Chinese culture affects the property prices in Hong Kong. In the past few years, the trend of Hong Kong economy changes dramatically. It suffers from both booming and slumping. Real estate market has observable changes once the economy is going to change. In this dissertation, the author aims at giving better explanations of how the graveyard view affects the residential property price by studying the property price of the chosen estates over the past decades.

Most appraisers always ignore Feng Shui matters. Graveyard view amenities are therefore over-estimated. Therefore, this study provides a reference point for surveying professionals and those buyers when concerning a graveyard view amenities. Town planner and developers have to account for the burden that graveyard view brings when they are making strategic decision in town planning and designing the layout of an estate.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Different countries researchers are always interested in areas related to property market. From time to time, many of them have used hedonic price model to study effects of different determinants of property price. Following their studies, the author is going to quantify the effect of graveyard view on property prices using hedonic price model. Before conducting the research, relevant literature on the hedonic price model would be covered.

2.2 Hedonic Price Theory

` Hedonic Price Theory is first developed by Rosen (1972)[12]. He employs this model to find out the implicit price, which is the hedonic price, of housing commodities on property values. He finds that the property composes housing traits and it is directly related to consumer's utility function. As a result, the demand of housing depends on the vector of demand for housing traits. In other words, Hedonic price approach indicated that the prices of properties are correlated to the preference for particular housing attributes. However, one is not able to put the housing traits in the market. As a result, Rosen develops a so-called implicit market and put those housing traits inside the market. According to this model, the total payment observed in the implicit market is viewed as reflecting the sum of all the housing traits bought in each of the corresponding implicit trait market. If applying Rosen ideas, this dissertation is studying the implicit effect of graveyard view on property price.

[12] Rosen, S. (1974), Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, Journal of Political Economy (January/ February), 82, pp. 34-55.

Rosen defines hedonic price as the implicit price of attributes and are revealed to economic agents from observed prices of differentiated products and the specific amounts of characteristics associated with them[13]. Therefore, in this study, the regression coefficient is measuring the implicit price of housing attributes that is selected by the author. Linneman (1982)[14] uses a simpler and non housing market example to illustrate Rosen's implicit price concept. He uses transactions in the supermarkets for his illustration. In the supermarket, different customers line up in the checkout counter with different bundles of grocery items due to differences in their family size, income, and other factors. If there is a researcher who is interested in knowing the price of a 7-oz can of beans but not able to check up the price in the price tag, hedonic price model will help him to determine the price of it. The origin of the research is recording as the total amount spent by each customer. If the researcher knows the total amount spent by consumers in groceries and the items purchased by these consumers, he can then determine the price of the 7-oz can of the beans. The total expenditures on grocery items G is simply the sum over all possible grocery items of price Pi times the quantity of item consumed Xi,

$$G = \sum P_i X_i$$

If the researcher can observe all of the X_i, then the price of a 7-oz can of beans is the change in total grocery payments brought about by adding one 7-oz can of beans into the grocery basket holding the rest of the bundle constant. Mathematically this is the partial derivative of G with respect to $X_{7\text{-oz}}$,

$$\partial G / \partial X_{7\text{-oz}} \equiv P_{7oz}$$

Therefore, by combining the above two equations and differentiating the hedonic function with respect to the item, the price of any one item is then known. Similarly, these partial derivatives are actually equivalent to the hedonic price equation

[13] Rosen, S. (1974), Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, Journal of Political Economy (January/ February), 82, pp. 34-55.
[14] Linneman, P. (1982), The Economics of Urban amenities: "Hedonic Prices and Residential Location". Academic Press, Inc., 69-88.

which consisted of a bundle of housing traits. It is regarded as the marginal change in the valuation of the property, ceteris paribus, as suggested by Rosen.

2.3 Housing Traits

After explaining the property actually composes of the implicit prices of the housing traits, the next step should be deciding what characteristics, or, housing traits should be included in the hedonic model[15]. He suggests that all characteristics that are relevant to the determination of market price should be included in principle. Bulter (1982)[16] percept this concept in another way, he suggests that those attributes that are both costly to produce and yield utility to residents should all be included. However, it is impractical in real life. Reasons behind are two fold. First, there is numerous of characteristics involved and second, data of many characteristics are either unavailable or of very poor quality. He adds that even there is no data constraint. The intrinsic clustering of characteristic combinations would lead to choices of relatively small number of configurations. He further points out that all estimates of the hedonic relationship are mis-specified to some extended by researchers specification bias of omitting some of the variables. However, Bulter agrees that the practical impact of these biases is small.

It is generally adequate for a researcher to include a small number but key variables in the model. If according to Bulter, those variables that are more costly to produce and yield more utility to residents should be in the first priority to be included. According to previous researchers, attributes chosen can be classified into three types in general:

(1) Structural traits (S)
(2) Locational traits (L)

[15] Griliches, Z. (1971), "Price Indexes and Quality Change", Harvard University Press, Cambridge, Mass.
[16] Bulter, R. V. (1982), The Specification of Hedonic Indexes for Urban Housing, "Land Economics", 58, pp. 96-108

(3) Neighborhood traits (N)

Thus the value of a property can be expresses as

$$P = F (S, L, N)$$

According to the hedonic price theory mentioned above, the partial derivative of the equation with respect to the above three types of housing traits is the implicit price, it also measures the contribution of the traits to the property price. In the following, focus will be move to those three mentioned categories of attributes.

2.3.1 Structural Traits

Structural traits are the structural type of the property being studied. Most literatures include structural traits in their study, as each single property must have its own structural characteristics. There is no definite interpretation of structure trait, variables included can be directly or indirectly relate to the property structure. It is very common for researchers to include more than one structural trait in the hedonic price function. But the common trend is just including those that are cost significant and yield utility to consumers, common structural traits include property's age, view, floor level and size.

Kain and Quigley's have already indicated the significant of structural attributes in 1975[17]. They use attributes that measure the dwelling-unit size and quality of dwelling units, of parcels and of block face. Both of them affect property price. They further find that the premium for paying for newness varies according to the property size. There is a close linkage between the payment of size and other housing attributes.

[17] Kain, J. and Quigley, J. (1975), "Housing Markets and Racial Discrimination". New York: National Bureau of Economic Research.

Rodriguez and Sirmans (1994)[18] and So et al (1997)[19] states the most important structural characteristics are age, floor level and size of the properties. Carroll et al (1996)[20] study the effect of floor area while some researchers concentrate on the negative effect of age of the building on the property prices (Clapp and Giaccotto 1998[21], Kain and Quigley, 1970[22]). The quality of exterior structure, conditions of existing floors, windows, walls, and even levels of housekeeping also affect the property prices significantly. (Kain & Quigley 1970[23]; Morris, Woods & Jacobson 1979[24]).

Different desirable views such as golf course fairway, lake and marsh have different level of positive impact on the property price. Similar results are generated by Wolverton (1997)[25]. He founds that both lot size and property view of a residential property are significant determinants of property price. He also shows that relationship between lot size and price is non-linear and confirms the law of diminishing marginal utility.

Mok et al (1995)[26] studies the effect of structural traits such as property size, age and floor level on property price in Hong Kong. Results of their four models show that the older the properties or the larger of its size, the lower the property price, while higher floor level give rise to property price. Apart from including those common

[18] Ridker, R. G. and Henning J. A. (1967), The Determinants of Residential Property Values with Special Reference to Air Polluation, "Review of Economics and Statistics, 44, pp. 246-257.
[19] So, H. M., Tse, R. Y. C. and Ganesan, S. (1997). Estimating the Influence of Transport on House Prices: Evidence from Hong Kong, "Journal of Property Investment and Valuation", 15, 1, pp. 40-74.
[20] Correll, M. R., Lillydahl, J. H. & Singell, L. D. (1978), The effects of greenbelts on residential property values: Some findings on the political economy of open space, "Land Economics", 54, pp. 206-217.
[21] Clapp, J. M. & Giaccotto, C. (1998), Residential Hedonic Models: A Rational Expectations Approach to Age Effects, "Journal of Urban Economics", 44, pp. 415-437.
[22] Kain, J. F. & Quigley, J. M. (1970), Measuring the Value of Housing Quality, "Journal of the American Statistical Association", 65, pp. 532-548.
[23] Kain, J. and Quigley, J. (1975), "Housing Markets and Racial Discrimination". New York: National Bureau of Economic Research.
[24] Morris, E. W., Woods, M. E. & Jacobson, A. L. (1979), The Measurement of Housing Quality, "Land Economics", 2, pp. 383-387.
[25] Wolverton, M. L. (1997), Empirical Study of the Relationship Between Residential Lot Price, Size and View, "Journal of Property Valuation and Investment", 15, 1, pp. 49-57
[26] Mok, H. M. K., Chan, P. P. K. & Cho, Y-S. 1995, A Hedonic Price Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.

structural traits such as size and floor level, Hung (1998)[27] tries to introduce a new structural variable, the bathroom to bedroom ratio in her study. However, results show that the effect of this variable on property price is not significant.

Grether and Mieszkowski (1974)[28] suggest other structural traits such as heating, electrical and plumbing systems, basement, storm window, fireplace, etc. also highly correlated with property price. However, they are not applicable in Hong Kong. For Hong Kong, the most important structural traits are still floor area, lot size, building age, and floor level. They are taken into account by most researchers.

2.3.2. Locational Traits

Locational traits are related to the locational characteristics of the selected property. Among the wide ranging variables, it is most common for researchers to include accessibility to economic and social facilities in their study.

Form time to time, researchers are very interested in finding out the effect of locational traits. The earliest literature discussing this topic is the one done by Alonso in 1964[29]. He pinpoints that the access to the city centre is recognized as the only factor that causes effect on the land rents. He comments that when consumers are choosing residential apartment, they only care about residential accessibility to a single work site. Consequently, assuming all consumers are identical, this model implied there is a monotonic decline in site payments as distance from work site increased. It is because residents that live further away required compensation to offset the increased transportation costs, it includes the higher commuting expenses and the longer traveling time required. This model proposed a simple trade-off between accessibility and price (land rent). Although his model is imperfect and being argued by other later researchers, his model has already made an important contribution on this topic.

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[27] Hung, Y. C. (1998), Neural Network Vs Hedonic Price Model in Residential Property Valuation, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.
[28] Grether D. M. and Peter Mieszkowski (1974), Determinants of Real Estate Values, "Journal of Urban Economics, 1, pp. 127-146.
[29] Alonso, W. (1964), Location and Land Use, Cambridge: Harvard University Press.

As discussed in the beginning, locational traits include accessibility to economic and social facilities. However, Alonso only takes into account of the variable of accessibility to city centre in relation to property price. Straszheim (1975)[30] argues that it is not enough and he suggests that Alonso has neglected the relocation cost, which is also a determinant factor. Apart from relocation cost, the accessibility to working area, which is usually the Central Business District (CBD) is treated as one of the economic facilities. Chau, Ng and Hung (2001)[31] refer accessibility to CBD as the traveling time, cost of travel required, level of convenience and the availability of different transport modes to reach the CBD. The recent study done by Mok et al (1995)[32] further includes distance from CBD as a locational variable when determining the prices of 1027 private residential properties in North Point, Hong Kong. He first defines the area of CBD, followed by measuring the actual distance in kilometers of the selected properties from edge of the defined CBD area, which is Causeway Bay MTR station. The empirical is significant to support his hypothesis that property prices decrease when distance from the CBD increases. In contrast, Kain and Quigley (1970)[33] find that higher income and well educated group opt to live further away from the CBD for better quality of life. It indicates that house price is determined not only by accessibility or travel costs, but also by other neighborhood characteristics such as air pollution and other environmental attributes of the location.

Hong Kong has a combination of high population density concentration of economic activities and its limited road space discourages extensive use of private cars. They also lend to a high dependence on public transport in the territory[34]. It was estimated that Hong Kong residents that depends on public transport carried about 90

[30] Straszheim, M. (1975) "An Econometric Analysis of the Urban Housing Market". New York: National Bureau of Economic Research, 1975.
[31] Chau, K. W., Ng, F. F. & Hung, Eastman C. T. (2001), Developer's good will as significant influence on apartment unit prices, "Appraisal Journal", 69, 1, pp. 26-31.
[32] Mok, M. K., Henry, Patrick P. K. Chan, and Yiu-Sun Cho (1995), A Hedonic Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.
[33] Kain, J. and Quigley, J. (1975), "Housing Markets and Racial Discrimination". New York: National Bureau of Economic Research.
[34] So, H. M., Tse, R. Y. C. and Ganesan, S. (1997). "Estimating the Influence of Transport on House Prices: Evidence from Hong Kong", "Journal of Property Investment Valuation, 15, 1, pp. 40-47.

per cent of all persons (Hau, 1988)[35] and more than 80 per cent of motorized trips are undertaken by public transport Meakin (1994)[36]. Thus, one would expect homebuyers are willing to pay more for properties with easy accessibility to their work or transporting means. Therefore, it is quite common for researchers to include accessibility to CBD and accessibility to transportation as locational variables.

So et al (1997)[37] estimates the influence of transport on Hong Kong property price by introducing another locational variable, transport accessibility, in his study. Transport accessibility, as defined by him, is the distances form the subject property to the nearest Mass Transit Railway (MTR), buses and minibuses station. They use the distances to the nearest stations of the mass transit railway (MTR), buses and minibuses as a proxy for measuring transport accessibility. The property prices they used are all drawn from the same and large residential area in Querry Bay, Hong Kong. By doing this, similar locational characteristics and income groups can be maintained and the effects of various internal attributes and environmental characteristics of the neighborhood are locationally insensitive. The results have shown the significant of those variables, except buses.

Soon after their study, Chau and Ng (1998)[38] confirm that an improvement in the efficiency of the transportation system would also help to reduce the price gradient from CBD to the peripheral of a city. They study the impact of the electrification of the KCR on the price gradient between properties in urban area, Shatin and suburban area, Tai Po. They conclude that the improvement in KCR service after 1982 has significant reduced the price gradient between the two places due to an increasing demand of suburban area properties.

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[35] Hau, D. T. (1998), "The Demand of Public Transport in Hong Kong, Department of Economics and Centre of Urban Studies and Urban Planning", The University of Hong Kong, pp 1-36.
[36] Meakin, R. T. (1994), "Prospects for City and Suburban Public Transport, in Dimitriou, H. T. (Ed.), Moving Away from the Motor Vehicle". The German and Hong Kong Experience, The Centre of Urban Plannign and Environmental Management, The University of Hong Kong, pp. 103-118.
[37] So, H. M., Tse, R. Y. C. and Ganesan, S. (1997), "Estimating the Influence of Transport on House Prices: Evidence from Hong Kong", "Journal of Property Investment Valuation, 15, 1, pp. 40-47.
[38] Chau, K. W. and Ng, F. F. (1998), "The Effects of Improvement in Public Transportation Capacity on Residential Price Gradient in Hong Kong, "Journal of Property Investment and Valuation, 16, 4, pp. 297-410.

Apart from including economic facilities as locational variable, accessibility of social facilities should also be included. Darling (1973)[39] includes distance from urban water parks in his regression model. The water park provides residence with the aquatic recreational facilities and the aesthetic quality view. The regression result is significant to show that the positive effect increases as the distance between the property and the park decreases as the ability for them to take the advantage increase.

There also other social facilities apart from water park. Harrison (1974)[40] uses the accessibility to schools and major highways as locational traits. Hung (1998)[41] includes variable of distance from shopping centre. In addition to this, So et al (1997)[42] add also the accessibility to swimming pool and sports facilities in the model. Mok et al (1995)[43] moves focus to the effect of school zone, distance from big estate and entertainment or sports facilities. To conclude, all the variables mentioned bring significant effect on the property prices.

Where there are many literatures recognizing the importance of locational traits, Megbolugbe (1989)[44] excludes the locational variables. The reason is actually the principle set by Bulter (1982)[45]. The exclusion is due to the relatively small area of Jos (average trip lengths are less than 1.5 km), together with the multiple employment centres in the town and the high mobility within it. Work trips become relatively unimportant in residential location decisions. Yet the independent variables still give a high explanation of the variation of the property prices. One shortcoming of this study us that price data are not obtained from market transaction but base on professional

[39] Darling, A. H. (1973), Measuring the Benefits Generated by Urban Water Parks, "Land Economics", 49 (Feb), pp. 22-34.
[40] Harrison, D. (1978), Hedonic Housing Prices and the Demand for the Clean Air, "Journal of Environment Economics and Management", 5, pp 81-102.
[41] Hung, Y. C. (1998), "Neural Network Vs Hedonic Price Model in Residential Property Valuation, "Unpublished BSc (Surveying) Dissertation", The University of Hong Kong.
[42] So, H. M., Tse, R. Y. C. and Ganesan, S. (1997), "Estimating the Influence of Transport on House Prices: Evidence from Hong Kong", "Journal of Property Investment Valuation, 15, 1, pp. 40-47.
[43] Mok, M. K., Henry, Patrick P. K. Chan, and Yiu-Sun Cho (1995), A Hedonic Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.
[44] Megbolugbe, I. F. (1989), A Hedonic Index Model: The Housing Price Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, 1, pp. 37-48.
[45] Bulter, R. V. (1982), The Specification of Hedonic Indexes for Urban Housing, "Land Economics", 58, pp. 96-108

judgment, they are appraisal data only. Therefore, there is criticism on the validity of the result.

2.3.3 Neighborhood Traits

Neighborhood traits are no doubt, related to the quality of the neighborhood of a property. Lineman (1980)[46] finds in his empirical study that neighborhood traits accounts for 17% to 48 % of the standardized variation of the site valuation. This shows neighborhood traits is also one of the important variables in determining the property prices. Similar to structural and locational factors, there is also uncountable number of neighborhood characteristics. Different researchers include different neighborhood traits in their study to investigate the effects of them on the value of nearby properties.

Generally, researchers find that environmental problems such as air, noise and water pollution lead to a reduction in property price. Pettit and Johnson (1987)[47], Cartee (1989)[48], Nelson, Genereux and Genereux (1992)[49], Bouvier and Hansen (1997)[50] all confirm that the noise created by land filling reduce nearby property prices while Blomquist (1974)[51] estimates the negative impact of coal fired power plant on property prices. Besides, Gautrin (1975)[52] and Espey and Lopez (2000)[53] suggest the impact of aircraft noise is also substantial for reducing property price. Mcmillan (1980)[54]

[46] Linneman, P. (1980), Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics, 8, pp. 47-68.
[47] Pettit, C. L. and Johnson, C. (1987), The Impacts on Property Values of Solid Waste Facilities, "Waste Age", pp. 97-104.
[48] Cartee, C. P. (1989), A Review of Sanitary Landfill Impacts on Property Values, "The Real Estate Appraiser and Analyst", pp. 43-46.
[49] Nelson, A. C., Genereux, J. and Genereux, M. (1992), Price Effects of Landfills on House Values, "Land Economics", 68, 4, pp, 359-365.
[50] Halstead, J. M., Bouvier, R. A. & Hansen, B. E. (1997), On issue of functional form choice in hedonic price function: Further evidence, "Environmental Management", 21, 5, pp. 759-765.
[51] Blomquist, G. (1974), The Effect of Electric Utility Power Plant Location on Area Property Value, "Land Economics", 50, 1, pp. 97-100.
[52] Gautrin (1975), An Evaluation of the Impact of aircraft on Property Values with a Simple Model of Urban Land Rent, "Land Economics", 50, pp. 80-86.
[53] Espey, M. & Lopez, H. (2000), The impact of airport noise and proximity on residential property values, "Growth and Change", 31, pp. 408-419.
[54] McMillan, M. L., Reid, B. G. and G, D. W. (1980), "An Extension of the Hedonic Approach for Estimating the Value of Quiet, "Land Economics", 56, 3, pp. 315-328

proposed that quietness does add value to the property. Ridker (1967)[55], Nelson (1978)[56], Harrison (1978)[57] and Chattopadhyay (1999)[58] shift their focus to air pollution problem or the demand of clean air. Furthermore, Poon (1978)[59] also finds that both noise and air pollution generated by railways in London and Canada also brings negative effect to property. Leggett and Bockstael (2000)[60] study the impact of water pollution. Simons, Bowen and Sementelli (1997)[61] further demonstrate the significant negative impact of underground storage tanks from gas station on residential and commercial properties nearby, up to 14-16% and 28-42% respectively. Users claimed that those petroleum compounds reduce the quality of the drinking water.

However, Clark et al (1997)[62] done a research to find out the impact of two nuclear power plants to nearby residents. Empirical results claim that it does not follow the normal trend by showing that it carries positive effect to nearby property prices. Clark's explanation is that nearby residents are all workers of those plants, the proximity of work place privilege the potential hazard of the nuclear plant.

Apart from nuisance, neighborhood's social fabric is another undesirable neighborhood characteristic. Vandell and Zerbst (1934)[63] include racial considerations while Thaler (1978)[64] as well as Li and Brown (1980)[65] studies crime and vandalism in

[55] Ridker, R. G. and Henning J. A. (1967), The Determinants of Residential Property Values with Special Reference to Air Pollution, "Review of Economics and Statistics", 44, pp. 246-257.
[56] Nelson, A. C. (1977), Hedonic Price, Price Indices and Housing Markets, "Journal of Urban Economics", 5, 4, pp. 357-369.
[57] Harrision, D. Jr and Rubinfeld, D. L. (1977), Hedonic Housing Prices and the Demand for Clean Air, "Journal of Urban Economics", 4, 4, pp. 81-102.
[58] Chattopadhyay, S. (1999), Estimating the demand for air quality: New evidence based on the Chicago housing market, "Land Economics", 75, 1, pp. 1- 22.
[59] Poon, C. L. Larry, Railway Externalities and Residential Property Prices", "Land Economics", 54, 2, pp. 218-227.
[60] Leggett, C. G. & Bockstael, N. E. (2000), Evidence of the effects of water quality on residential land prices, "*Journal of Economics and Management"*, 39, pp.121-144.
[61] Simons, R. A., W. Bowen and A. Semetelli (1997), The Effect of Leaking Underground Storage Tanks on Residential Sales Price, "Journal of Real Estate Research", 14, 1, pp. 29-42.
[62] Clark, D. E. Michelbrink, Allison T. and Metz, W. C. (1997), Nuclear Power Plants and Residential Housing Prices, "Growth and Change", 28, pp. 496-519.
[63] Vandell, K. D. and Zerbst, R. H. (1984), Estimates of the Effects of School Desegregation Plans on Housing Values Over Time, "The Journal of the American Real Estate and Urban Economics Association", 12, pp. 109-135.
[64] Thaler, D. 1978, A note on the value of crime control: Evidence from the property market, "Journal of Urban Economics", 5, pp. 137-145.

their researches. Galster (1994)[66] examines the effect of homes for the mentally disables while Hung (1998)[67] investigates the effect of public housing. Results of their studies indicate that both factors exerts penalty to surrounding properties. Wong (2000)[68] found that in Hong Kong, murders and suicides not only bring negative effect incident property value, but also the nearby property units. He explains the phenomenon by the belief of Feng Shui in Chinese Society.

Nuisance and social fabric bring penalty while community facilities bring premium to property prices. It includes the quality of public schools nearby (Clauretie & Neill 2000[69]; Haurin & Brasington 1996[70]), the accessibility to shopping complexes (Des Rosiers, Lagana, Theriault & Beaudoin 1996[71]; Sirpal 1994[72]), hospitals (Huh & Kwak 1997[73]), and places of worship such as churches (Carroll, Clauretie & Jensen 1996[74]).

To conclude, both tangible and intangible neighborhood's social fabrics affect property value in different culture societies in different extents.

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[65] Li, M. and Brown, H. J. (1980), Micro-Neighborhood Externalities and Hedonic Housing Prices, "Land Economics", 54, pp. 124-141.
[66] Galster, U. and Williams, Y. (1994), Dwelling for the Severely Mentally Disables and Neighborhood Property Values, "Land Economics", 70, 4, pp. 466-477.
[67] Hung, Y. C. (1998), Neural Network Vs Hedonic Price Model in Residential Property Valuation, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.
[68] Wong, S. S. (2000), How to Murders and Suicides in an Apartment Affect the Values of Nearby Properties?, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.
[69] Clauretie, T. M. & Neill, H. R. (2000), Year-round school schedules and residential property values, "Journal of Real Estate Finance and Economics", 20, 3, pp. 311-322.
[70] Haurin, D. R. & Brasington, D. (1996), School quality and real house prices: Inter- and intrametropolitan effects, "Journal of Housing Economics", 5, pp. 351-368.
[71] Des Rosiers, F., Lagana, A., Theriault, M. & Beaudoin, M. (1996), Shopping centres and house values: An empirical investigation, "Journal of Property Valuation & Investment", 14, 4, pp. 41-62.
[72] Sirpal, R. (1994), Empirical modeling of the relative impacts of various sizes of shopping centres on the value of surrounding residential properties, "Journal of Real Estate Research", 9, 4, pp. 487-505.
[73] Huh, S. & Kwak S. J. (1997), The choice of functional form and variables in the hedonic price model in Seoul, "Urban Studies", 34 (7), pp. 989-998.
[74] Correll, M. R., Lillydahl, J. H. & Singell, L. D. (1978), The effects of greenbelts on residential property values: Some findings on the political economy of open space, "Land Economics", 54, pp. 206-217.

View attributes

Different types of view in the property's neighborhood affect property prices in different extent. Do (1995)[75] shows empirically that golf course increase property price by 7.6%. Correll et al (1978)[76] examine the effect of green belts in Colorado. The empirical results show consistence with the hypothesis that residential property values decline with distance from the greenbelt in its neighborhood. Therefore, green area is certainly another desirable factor for household. Apart from green area, sea view is another preferable view for many people. Brown & Pollakowski (1977)[77], Poland (1980)[78], Huang (1996)[79], Mok et al (1995)[80] all find that sea view have a significant implicit values on residential property prices. Similar to sea view, ocean view (Benson, Hansen, Schwartz & Smersh 1998[81]) and lake view (Darling 1973[82]) also brings premium to property prices, Instead, Ho (1999)[83] claims that river view contributes the highest implicit value in Hong Kong, followed by sea view and racecourse view. However, graveyard view brings negative cost to amenity.

Huang (1996)[84] uses neighborhood amenity level as the neighborhood traits. He concludes from empirical evidence that estate-type development do have positive impact on property's market value, probably owing to same desirable inherent amenities.

[75] Do, A. Q. and Grudntiski, G. (1995), Golf courses and Residential House Price: An Empirical Examination, "Journal of Real Estate Finance and Economics", 10, pp. 261-270.
[76] Correll, M. R., Lillydahl, J. H. and Singell, L. D. (1978), The Effect of Greenbelts on Residential Property Values: Some Findings on the Political Economy of Open Space, "Land Economics"
[77] Brown, G. M. Jr. and Pollakowski, H. O. (1997) "The Economics of Urban Amenities: Specifying the Demand for Housing Characteristics: The Erogeneity Issue". Academics Press, Inc., pp. 89-102.
[78] Pollard, D. B. Jr. (1980) Topographic Amenities, Building Height, and the Supply of Urban Housing, "Regional Science and Urban Economics", 10, 181-199.
[79] Huang, S. Y. Raymond (1996). An Empirical Study of the Price Differentials of Private Residential Properties as Contributed by the "Estate" Factors and Amenity Levels through the Hedonic Regression Approach, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.
[80] Mok, H. M. K. (1995), A hedonic approach to pricing of residential properties in Hong Kong, "Hong Kong Journal of Business Management", 8, pp. 1-15.
[81] Benson, E. D., Hansen, J. L., Schwartz, A. L. & Smersh, G. T. (1998), Pricing residential amenities: The value of a view, "Journal of Real Estate Finance and Economics", 16 (1), pp. 55-73.
[82] Darling, A. H. (1973), Measuring benefits generated by urban water parks, "Land Economics", 49, pp. 22-34.
[83] Ho, H. W. (1999), Empirical Study of the Impact of Views on the Apartment Prices, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.
[84] Huang, S. Y. Raymond (1996). An Empirical Study of the Price Differentials of Private Residential Properties as Contributed by the "Estate" Factors and Amenity Levels through the Hedonic Regression Approach, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.

He explained that estate-type development allows the developer with opportunities for better planning in combination of block relationships, view, pedestrian movement, provision of facilities and landscaped space. They altogether bring a better environment for living and thus, bring premium to properties nearby.

Significance of graveyard view

There is numerous literatures focus on the effects of dwelling specific attributes, location, MTR stations, pollution, etc. However, not much study is carried out to investigate the effect of graveyard view on property prices. Chin et al (2004)[85] prove that the penalty of graveyard view amenities is more serious during boom period than normal or slump period in Malaysia. In order to compare the differences in burden carried by different attributes before and after the Asian Financial Crisis, they study two sets of transaction records. One is based on the year 1996 while the other one is based on the year 1998. They find that the penalty carried by graveyard view is 7.8% more in 1996 than in 1998. Graveyard view is more unwelcome by people in Malaysia before the outbreak of Asian Financial Crisis. For the effect of graveyard view on Hong Kong property prices, only Ho (1999)[86], Tse and Love (2000)[87] prove that graveyard view brings penalty to property prices. No researcher has chosen Hong Kong to study the amount of penalty brought by graveyard view during boom and slump periods.

[85] Chin, T. L., Chau, K. W., Ng, F. F., The Impact of the Asian Financial Crisis on the Pricing of Condominiums in Malaysia, "Journal of Real Estate Literature", 12, 1, pp. 33-49.
[86] Ho, H. W. (1999), "An Empirical Study of the Impact of Views on Apartment Prices", Department of Real Estate and Construction, unpublished.
[87] Tse, R. Y. C. & Love, P. E. D. (2000), Measuring residential property values in Hong Kong, "Property Management", 18, (5), pp. 366-374.

CHAPTER THREE

GRAVEYARD VIEW AS A HOUSING ATTRIBUTE

3.1 Introduction

Ho (1999)[88], Love (2000)[89] all suggest that graveyard view is a negative neighborhood attribute and the result of the hedonic model shows that it brings a negative effect to property price. Graveyard view is regarded as an unattractive view and is unwelcome by most Chinese. They tend to reject this kind of view from their own living place. Why consumer, especially Chinese, behave like this? According to author's research, there are there main reasons,

i). the uncertainty after death and the concept of rebirth of death in Chinese culture makes them being afraid of those ghost (gwae).
ii). the Feng Shui theory, i.e. balancing of yin and yang.
iii). the psychological effect of graveyard view on human being, especially Chinese.

The third reason is an implication of the first two and the first two reasons alone are not strong enough to explain why graveyard view is unwelcome by ethical Chinese. In other words, the cultural effects on the concept of death and the Feng Shui believes in Chinese bring a negative psychological effect to Chinese people. After elaborating these, the author would discuss why property values of graveyard view amenities are lower than other views.

[88] Ho, H. W. (1999), "An Empirical Study of the Impact of Views on Apartment Prices", Department of Real Estate and Construction, unpublished.
[89] Tse, Y. C. R. and Love, E. D. P. (2000). Measuring Residential Property Values in Hong Kong, "Property Management". Vol. 18, No. 5, 2000 pp. 266-274, MCB University Press.

3.2 Cultures and Believes

3.2.1 Uncertainty of Death in Chinese Culture

The after death concept is already discussed by Seligmann and Seligmann (1911) while the Vedda of Sri Lanka perform ceremony to encourage the spirit of the person just deceased to bring them luck in hunting and honey gathering. Rosenblatt et al. (1976)[90] shows that most people around the world believe in the reality of spirits of the dead. Child (1993)[91] further suggested that spirits are usually thought to be dangerous during first few days after death.

All of the above evidenced that not just Chinese have the concept of after death spirit. However, different people sharing different cultural backgrounds would percept this concept in different ways. In this section, the differences between Chinese and Western culture and reasons of those differences would be discussed.

The origin of Feng Shui together with other superstitious practices in China comes from the folk religion. It is the earliest and most primitive forms of religion in China. After tenth century A.D., folk religion gradually was joined with Taoism and Buddhism. The combination became powerful reinforcement in Confucianism.[92]

In China, ancestors are always friendly and benevolent. They hover around their descendants and bless them. Some people house their own ancestors inside their house so that they can worship their spirit everyday. Some people house their ancestor in a good Feng Shui burial site. They then "visit" their ancestor and worship them during "Tsing-ming Festival", which is also known as the "Festival of the Tombs".[93]

[90] Rosenblatt, P. C., Walsh, R. P. & Jackson, D. A. (1976) "Grief and Mourning in Cross-cultural Perspective." New Haven, CT: HRAF Press.
[91] Child, A. B. (1993) Chapter 4: Mystical Beings. "Religion and Magic in the Life of Traditional". Englewood Cliffs, N.J.: Prentice Hall.
[92] Orr, R. G. (1980) Chapter 6: Religion in Traditional China. "Religion in China". New York: Friendship Press. pp. 85-98
[93] Nevius, J. L. (1872) "China and the Chinese: a General Description",. New York: Harper & Brothers. Chapter 18, National Festivals, Customs and Amusements, pp. 257-274.

All of those act showing their respect to their own ancestors. Aijmer and Ho (2000)[94] argue that although dead spirits rarely seem to do any harm to their living descendants, it does not mean that one's own ancestors are less dangerous than those of neighboring families or even homeless malevolent spirits. In short, the presence of ancestors is then perceived just as fearsome as they suppose that they are constantly hovering around them.

Eiltel (1993)[95] comments the deepest root of Feng Shui system grew out of the excessive and superstitious veneration ancestor's spirits. The spirit of ghost, therefore, contributes an important part in Feng Shui. Grave, actually is the "house" of dead people. In ancient Chinese, people classify dead people, as ghosts (gwae). Nevius (1872)[96] states that it is generally belief that the soul of after death required atoning for its sins by confinement in Hades until it is permitted to reappear in another state. They exist as gwae and hang around the earth. They carry variety of diseases and their inflictions are to obtain food, or rather the scent or exhalations from food. Some people therefore believe that sickness of a person is due to the agency of spirits. Furthermore, Orr (1980)[97] states that Chinese believe the spirits of one's ancestors would punish moral offenders and see that good behavior was rewarded. It explains why people, especially those have done something wrong, are afraid of ghost.

Chinese also believe that during Hungry Ghost Festival, ancestors return and visit their former homes. In the belief of Taoism, People perform ceremony called "Fang yin kau" or "Shi-Shih" in this festival. It includes burning paper money and articles to the dead to use. Orr (1980)[98] comments Chinese leaders had little sympathy on Taoism. They consider it is intertwined with ancient folk customs and superstitions,

[94] Aijmer, G. and Ho, K.Y. (2000). "Cantonese Society in a Time of Change." Hong Kong : Chinese University Press
[95] Eitel, E. J. (1993) "Feng Shui : the Science of Sacred Landscape in Old China" Bonsall, Calif. : Synergetic Press, 7th ed.
[96] Nevius, J. L. (1872) "China and the Chinese: a General Description",. New York: Harper & Brothers. Chapter 12, Superstitious Notions Respecting Spirits, and the Science of Feng Shwuy, or Geomancy, pp. 162-178.
[97] Orr, R. G. (1980) Chapter 6: Religion in Traditional China. "Religion in China". New York: Friendship Press. pp. 85-98.
[98] Orr, R. G. (1980) Chapter 8: Taoism and Folk Religion. "Religion in China". New York: Friendship Press. pp. 105-108

with no ethical foundations, and even barrier for raising cultural level. Although it is rejecting by the Central Government, this kind of practice still carries on nowadays. According to Navius (1872)[99], the object of these ceremonies is to secure heath and peace for the family or neighborhood, by satisfying and propitiating the spirits. From this perspective, they are also classified ghost as horrifying representatives of death, demanding and dangerous. Furthermore, people are more afraid of those unnatural dieing people, for example, people committing suicide or murder. They think that they are more dangerous as they would return and want to claim for someone that causing their death.

Rebirth of death is also common belief for both Chinese and Western people. In Austrian, people believe that spirits provides the spiritual part of the new human life.[100] While in North American North-west Coast, some thought that spirits will reincarnate in new members of the family[101]. In China, although people believe the rebirth of dead, some of them still continuous to worship their ancestors in grave or at home consistently. Welch (1967)[102] describes this kind of behaviors is not only an expression of paradoxical religious syncretism, a fusion of Buddhism and indigenous ideas, but also a pragmatic modus operandi employs by filial descendants to maximize the well-being of their deceased ascendants in a situation of uncertainty.

For the uncertainty after death as well as fearsome feeling of returning of ghosts, especially during Hungry Ghost Festival, Chinese people avoid having connection with ghosts and tend to live further away from yin dwellings, the grave. They think that it can reduce the chances of harmfulness carried by ghosts.

If applying above literature to the situation of Hong Kong, properties that are closer to the graveyard, no matter they are sharing the graveyard view or not, should

[99] Nevius, J. L. (1872) "China and the Chinese: a General Description",. New York: Harper & Brothers. Chapter 12, Superstitious Notions Respecting Spirits, and the Science of Feng Shwuy, or Geomancy, pp. 162-178.
[100] Strehlow, T. G. H. (1947) "Aranda Traditions". Melnourne: Melbourne University Press.
[101] Child, A. B. (1993) Chapter 4: Mystical Beings. "Religion and Magic in the Life of Traditional". Englewood Cliffs, N.J.: Prentice Hall.
[102] H, Welch. (1967). "The practice of Chinese Buddhism." Cambridge, Mass. : Harvard University Press

contribute a greater penalty due to the fearsome of dead spirits. In other words, the whole block of building should subject to similar level of price penalty but not only those subject to graveyard view. As a result, it is not strong enough to support the argument that people reject the graveyard view property because they are afraid of ghost that is hovering around their home.

3.2.2 The Relationship between Culture and Behavior

Before discussing how culture influence people's behavior, it is important for one to know what culture is.

The concept and definition of culture varies from people to people, and from time to time. The Oxford Dictionary (2004)[103] gives the definition of culture as (1) way of customs and belief, art, way of life and social organization of a particular country or group and (2) "The beliefs and attitudes about something that people in a particular group or organization share". In this respect, culture is sometimes taken to refine or enlighten the arts of life.

Tylor (1873)[104] expresses the concept of culture is "a complex whole which includes knowledge, belief, art, moral, law, custom, and any other capabilities and habits acquired by man as a member of society". According to Keesing (1976)[105], culture refers ideas exists only in the mind. He regards culture as "totality of learnt and socially transmitted behavior". According to his view, the prospect of culture has moved from technical side to more human side. Nowadays, culture is a term in anthropology which is a rather new branch of knowledge, known sometimes as the science of man, deal with the behavior or cultural pattern of human race.[106]

[103] Hornby, A. S. (2004), "Advanced Learner's English Chinese Dictionary", Oxford University Press, Oxford Newyork, Oxford: Oxford University Press.
[104] Tylor, E. B. (1873), "Primitive culture: researches into the development of mythology, philosophy, religion, language, art and custom", London : J. Murray.
[105] Keesing, R. M. (1976), "Cultural Anthropology: a contemporary perspective", New York : Holt, Rinehart and Winston.
[106] Cheung, T. K. (1980), "The world of the Chinese: a struggle for human unity", Hong Kong : Chinese University Press.

Cheung (1980)[107] explains that culture is developed by people in a specific surrounding, and being adjusted to particular environment. Every country or nation has their own culture. Apart from the view that culture is developed by people, Greg (1999)[108] suggests that culture is opened to substantial reinterpretation and reinvention. Thus, is not static and subject to change from time to time.

There are differences in Feng Shui practice between different Chinese societies in different countries, For example, China and Singaporeans illustrates Cheung's and Greg's concept of adjustment in culture. In China and Korea, people search for good Feng Shui sites with the balance of ying and yang, li and qi, for their ancestors. However, according to Nobel (1994)[109], Grave or burial Feng Shui contributes an almost insignificant part of the discipline in Singapore. She comments that it is due to the relative lack of choice about where and how people can be buried in Singapore. The huge expenses involved in a lengthy and labor intensive process is also a reason behind. People tend to cremate their ancestor and keep their ash in large cemetery site. In Hong Kong, the town planning and the uses of land are straightly regulated by the Government. Therefore, Hong Kong situation is quite similar to Singapore with the exception that Hong Kong people still concern on the burial Feng Shui but there is just limited choice for them.

Bond (1991)[110] states that Chinese regard external forces, i.e., political forces, changes and other people, as more influential than their individual perception. On the basis of Cheung's and Bond's perceptions, we are now able to explain why Chinese culture is so different from the West. Different history of development, different language they use, and even the difference in psychological reactions relating to society changes altogether contributes the significant differences in Chinese and Western culture.

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[107] Cheung, T. K. (1980), "The world of the Chinese: a struggle for human unity", Hong Kong : Chinese University Press.
[108] Greg, S., "Asian Values, Western Dreams: Understanding the New Asia", St Leonards, N.S.W.: Allen & Unwin.
[109] Nobel, S., "Feng Shui in Singapore", Singapore: Graham Brash.
[110] Bond, M. H., "Beyond the Chinese Face: Insight from Psychology", Hong Kong: Oxford University Press.

Some people consider Feng Shui as a kind of superstitious. However, there is still a lot of people believe in it. May be the origin or history of Feng Shui can be explained by Bond (1991)[111], he suggests that Chinese people rely more on other people comment more than their own feeling. This kind of behavior may be due to most of the Chinese in the past are not well educated. Hu et al (1960)[112] comment that unlike Europe, education created gentry as a class, while China is a gentry-led society. Therefore, people with low level of education, with little knowledge and low ability to interpret and analyze, tends to depend on others comments.

3.3 Feng Shui

3.3.1 History of Feng Shui

The history of Feng Shui can be traced back to the 19th century, while two great scholars with entirely different view points, decided to write down their opinions on paper. The "Form School" systemically describes the characteristics of scenic formations while the "Compass School" emphasis on the symbolism of the points of the compass. Hereafter, a collection of odd maxims and folklore drawn from common sense and vivid imagination introduced, it is known as the "Third" school of Feng Shui.[113]

Borschmam (1923)[114] defines the meaning of Feng Shui as "wind-water" and its wider sense stand for the relationship with the surrounding nature, the influence of landscape on the beauty of the buildings and the happiness of the inhabitants. In simple words, it is the general impression of the qualities of an environment. Therefore, Feng Shui sometimes is just an ascetical and psychological issue.

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[111] Bond, M. H., "Beyond the Chinese Face: Insight from Psychology", Hong Kong: Oxford University Press.
[112] Hu, C. T. et al (1960) "China: Its People Its Society Its Culture". Edited by Hsiao Hsia. New Haven, Conn. : Human Relations Area files Press
[113] Walters, D. (1991) "The Feng Shui Handbook: A Practical Guide to Chinese Geomancy and Environmental Harmony" London : Aquarian Press, 1991
[114] Borschmam, E. (1923) "Picturesque China, architecture and landscape : a journey through twelve provinces", London : Unwin.

A more modern definition of Feng Shui is given by Skinner (1983)[115]. Similar to Borschmam, he describes Feng Shui as the art of living in harmony with the land. He further adds that Feng Shui is the study of deriving the greatest benefit, peace and prosperity from being in the right place at the right time.

Feng Shui is also known as geomancy and it is routinely applied to the sitting of two kinds of dwelling, "yang" (houses) for the living and "yin" (graves) for the dead. The meaning of "yang" and "yin" is masculine and feminine respectively. For residential units sharing good Feng Shui, there should be a balance of yin and yang. It is also a study of the status of "li" (principle), the order of nature, as well as the existence of "chi", cosmic current or earth energy, in location. Special topographical features, such as configuration of land forms and direction of watercourse, of each specific piece of land direct the flow of "chi".[116] The Gugong of Beijing, which has served 24 emperors as their imperial places since AD 1420, the architectural design has altered in order to get the best benefits from good Feng Shui. For example, the Wai and Neijin Shuihe symbolize wealth and good "chi" being brought into imperial household.[117] The sitting of both dwellings should also be very careful. Moreover, the People believe "li" is essential for people's well being and success in life. On the other hand, it can also bring disaster to the living if there is any flow of "sha", that is the opposite of "li". Examples of objects that bringing "sha" include tunnels, roads and pathways.

Apart from "yin", "yang", "li" and "chi", the "five elements theory" is also very important in the study of Feng Shui. Five elements include Earth, Metal, Water, Wood and Fire. Basically, elements that are next to each other in the above order helps each other, i.e. Earth helps Metal, Metal helps water, and so on. It is known as the generative order. However, when two elements stand next to each other in the above series, one destroys the other. Earth damages Water, Metal damages Wood, etc. Therefore, the predominant elements of the site and its surroundings should be found

[115] Skinner, S. (1983) "The Living Earth Manual of Feng-Shui : Chinese geomancy", Singapore : Graham Brash.
[116] Eitel, E. J. (1993) "Feng Shui : the Science of Sacred Landscape in Old China" Bonsall, Calif. : Synergetic Press, 7th ed.
[117] Lip, E. (1995) "Feng Shui: Environment of power: a study of Chinese architecture." London: Academy Editions.

when accessing the Feng Shui qualities of the site.

Nowadays, Feng Shui remains popular in Chinese villages and in many cities in Asia, wherever Chinese influence is strong.[118] The beauty of and the belief in Feng Shui is also wide spreading in the West as well.

3.3.2 The Balance of Ying and Yang

In the previous section, the author has reviewed the history of Feng Shui. Now, the importance of the balance in Ying and Yang is further discussed, as it is a determinant factor of property's Fung Shui, as affect by graveyard view.

Walters (1991)[119] refers Feng Shui to the characteristics of i). the site: a particular defined place (including yin dwellings) which is being investigated; ii). the location: the surrounding of the site, while Wong (1996)[120] further defines that it is consist of general layout and features of its immediate environment; iii). the environment: the qualities of the location; and (iv). The orientation: the direction faced by the site. Therefore, one can see that the location of the site is a determinate factor for having good Feng Shui. In short, the environment surrounding the properties play an important role and one of those are the balance of Ying and Yang.

Generally, the principals of Feng Shui used for both yin and yang dwellings are quite similar. A good place to live in is also a good place to bury the dead. When sitting burial place (the yin dwellings) for their deceased relatives, Chinese also pay great attention to the desirability of good Feng Shui.[121] People believe that the "ling po", which is the spiritual energy, of the ancestors is linked to those of the decedents.

[118] Greg, S., "Asian Values, Western Dreams: Understanding the New Asia", St Leonards, N.S.W.: Allen & Unwin.
[119] Walters, D. (1991) "The Feng Shui Handbook: A Practical Guide to Chinese Geomancy and Environmental Harmony" London : Aquarian Press, 1991
[120] Wong, E. (1996) "Feng Shui: the Ancient Wisdom of harmonious living for modern times." Boston : Shambhala.
[121] Wong, E. (1996) "Feng Shui: the Ancient Wisdom of harmonious living for modern times." Boston : Shambhala; Eitel, E. J. (1993) "Feng Shui : the Science of Sacred Landscape in Old China" Bonsall, Calif. : Synergetic Press, 7th ed.

Descendants are able to enjoy health and prosperity if their ancestors are living in a good Feng Shui burial site.[122] For example, they look for the approximation of an "armchair position", that is, with hills on three side and perhaps high mountains way out on the horizon in front of the tomb[123].

On the other hand, people are also searching for site facing the sea with mountain at the back for their own house (the yang dwellings). A good Feng Shui site for a yin dwelling is also a good one for the yang dwelling. There seems to be a competition of sites with good Feng Shui. As discussed before, land in Hong Kong is limited, and most of residential building blocks have to share both good and bad Feng Shui orientation. Therefore, many estates sharing sea view need to face graveyard view as well. Moreover, with rapid growth of population, it is quite difficult for all people to get rid of graveyard view as many residential buildings were being built after the graveyard is located. Data sets used in this research are very good examples illustrating this phenomenon. From the above, one can see that it is quite difficult to have a full location separate yin and yang dwellings in Hong Kong.

The crucial point is that in Feng Shui, yin and yang dwellings should not be located so close or facing each other. Too much "yin chi" will influence people heath. Except from graveyard, another place that has even worse Feng Shui is the funeral chapel. The "yin chi" in the funeral chapel is even greater than graveyard because of its more frequent moving of the dead.

There is an interesting point worth mentioning. There are many other modern structures in the environment that also affect amenity's Feng Shui. Some of them even carry more severe impact to tenants according to the Feng Shui theory. For example, the power transmitting tower and the shape of roads can affect one beings heath and financial status. If Feng Shui is correlated with property prices, those amentias should share the same or an even greater penalty to the property price.

[122] Lip, E. (1997) "What is Feng Shui", London, England: Academy Edition.
[123] Bruun, Ole. (2003) "Fengshui in China: geomantic divination between state orthodoxy and popular religion." Copenhagen : NIAS Press, pp146-149.

However, those are usually ignored by the purchaser or user. Another extreme example is bus terminal and MTR station located under residential estate. In Feng Shui, the flowing of vehicles under the building blocks is similar to the flowing of water, it is regarded a kind of "sha"[124]. It affects tenant's health. However, property prices of those residential blocks do not dropped, but increase significantly due to the ease of transport[125]. In fact, all those effects mentioned are not known unless tenants hire a Feng Shui expert to examine their property. Therefore, base on this, it is not quite right to explain the effect of graveyard view on property by the reason of Fend Shui, as there is many other bad Feng Shui properties share a better price than graveyard view properties.

The price effect of graveyard view may not simply due to the Feng Shui. In fact, it may be due to the cultural belief in people's mind that has been mentioned in the previous section. Graveyard makes people feel unpleasant. In the perception of Feng Shui, Feng Shui experts comment that a good Feng Shui apartment should be giving the liver a comfort feeling. This is another reason why graveyard view amenities share bad Feng Shui apart from the explanation of "Yin-Yang Theory".

3.4 How Graveyard Affect People in a Psychological View

Chinese put a taboo on the word "death" and tend to avoid them from time to time. They avoid touching it, seeing it and even saying it in everyday life. Especially during Lunar New Year, Chinese believe that saying the word death will bring them bad luck for the whole year. The following examples further evidence the differences in the degree of acceptable of death in Chinese and Western culture.

In Hong Kong, careers that related to death (e.g. working in the cemetery or funeral) are unwelcome by most of the Chinese. Highly educated people and clerisy

[124] Chen, X. (2002), "新樓風水年鑑 2002-2003", 天機出版社
[125] So, K. L. (2000), Empirical Study of the Effects of MTR on Residential Property Value in Hong Kong, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.

refuse to enter those careers. Although there is film talking about Feng Shui and use it as the origin of the story, it talks about how Feng Shui can affect people's luck and how to use Feng Shui techniques to avoid bad luck. Films seldom use "death" as the theme of the story. Instead, there is a television series called "Six Feet Under"[126] introduced by HBO in the American. The story talks about how a family operates the funeral business. This television series is very popular, continuous introducing new series and has been nominated for Outstanding Drama Series at the 2005 GLAAD[127] awards to be held on April 2005 in Los Angelos. The outstanding success of this television shows that Western people can accept the saying of "death" rather then regarding it as a taboo.

Base on the cultural effect as mentioned before, Chinese does not want to touch anything about "death". For example, the number "four" sounds like "death" in Chinese pronunciation. One can observe that floor level associated with "four" is avoided in many newly constructed residential building in Hong Kong. It is because developers understand that the number "four" brings penalty to the property price and is rejected by most Hong Kong people. The impact of graveyard view in Chinese society becomes greater than in other nationalities. In this section, the author is going to discuss how Chinese look at the impact of graveyard view base on psychological explanations.

Chinese think that graveyard damage the Feng Shui of the property by the imbalance of "yin" and "yang". It would affect their health in some extent. This effect may be explained scientifically. When mentioning health, it can be classified into psychical health and psychological health. Rodin and Salvoey (1989)[128] claim that health and illness can simply considered as physical matters. However, it is widely assumed that behavioral science contributes strongly to an understanding of physical health and illness. Therefore, one can say graveyard view may not affect one being's physical health directly. However, it may affect them psychologically first, and then damage their physical health subsequently. The bad feeling when they are facing the grave is a psychological effect that usually evokes naturally and simultaneously. In

[126] Ball. A, "Six Feet Under", New York, N.Y. : HBO Video, c2002.
[127] The Gay & Lesbian Alliance Against Defamation (GLAAD)
[128] Rodin, J & Salovey, P. (1989), Health Psychology. "Annual Review of Psychology", Palo Alto, CA: Annual Reviews, 40, 533-579.

short, Chinese feel uncomfortable and unhappy when seeing a grave. If the effect is serious, it would affect their psychological health and then physical health.

In this section, how happiness connected with psychological health is first discussed. Then, the impact of stress that brought by graveyard view will be put forward in order to analyze the why people refuse to live in an apartment with graveyard view.

3.4.1 Relationship between Happiness and Psychological Health

Ways to achieve happiness

Positive thinking

When determining one being is in a good status psychologically, happiness of him/ her plays an important role. When people think positively, they usually live happily. Linedemen (1998)[129] pinpointed that positive thinking is not necessarily the denial of unpleasant, unacceptable, or bad things in the world; it's another way of seeing things altogether and an alternate perspective that put these bad things in their place. Therefore, although positive thinking people are still suffering from pressure or other unpleasant things in their life, they are more able to percept their life positively and living with bad memory happily.

Positive thinking is suggested by psychologists, it improves people's life satisfaction but it requires practicing. It is a worldwide phenomenon that most people tend to remember bad things instead of good things. One of the consequences of negative thinking (failing to see the bright side) is the creation of unpleasant memories. Creation of the negative memory make people even thinks more negative. Therefore, the effect is cyclical. In fact, it is the reality of the most people in the society. When people experiencing negative event or suffering from pressure, bad memory come up and they would think they are the worst in the world. For example, one cause of various

[129] Linedeman, L. (1998), "Emotion Toolkit", http://emotiontoolkit.com/posthink.shtml

kinds of cancer is pressure and living unhappily. It also explains why the outbreak of cancer is more serious in developed countries than in developing countries. The effect of stress on health would be further discussed later.

For people living near the grave, they would subject negative thinking related to death as they are continuously facing the grave everyday. Therefore, when those people suffering from bad events, it is not impossible for them to think negatively. If it keeps on for a long time, it will definitely affect their physical health.

The benefits of religion to the individual

What requirements are needed for living happily? Wilson (1967) shows that both personality and demographic factors correlate with subjective well being. He states that a happy person is a "young, healthy, well-educated, well-paid, extroverted, optimistic, worry-free, religious, married person with high esteem, job morale, modest aspirations, of either sex and of a wide range of intelligence." Therefore, there is many different ways to make people happy. In this section, the author would like to draw an attention to the power of religion on one being.

On the basis of social psychology, many scholars has been studied the impact of religion on people. For example, McCullough (2002)[130] states that most religious and spiritual traditions instruct their followers in some sort of daily exercise in the expression of gratitude[131] to a higher power, i.e. Christian says thanks to God when they are praying, even when they are facing challenges. They see challenges as chances for them to learn new things rather than thinking that it is bad luck. In Chinese, Buddhism followers also have similar practice. They bring some food with them when thanking their God. Weber (1922)[132] also thinks that religion provides a solution to the irrational problems of life such as suffering, illness, unfairness and evil. Their ideas is

[130] , McCulloughm, M. E. (2002), The Grateful Disposition: the Conceptual and Empirical Topography, "Journal of Personality and Social Psychology", 82, 1, 112-127.
[131] Gratitude helps increasing our life satisfaction by encourage people to recall our memory and help them to think positively. It provides another angle for people to precept things.
[132] Weber, M. (1904), "The Protestant Ethic and the Spirit of Capitalism", London: Allen & Unwin.

supported by Argyle (1992)[133], he views religion as another sphere of human quest and fulfillment, like relationship and work, or like health and happiness. He also suggested that a list of problems includes intellectual problems such as "what is the purpose of life?" and some unacceptable aspects of life such as suffering and death are also to be solved by religion. Baker and Gorsuch (1982)[134] find that while extrinsic religiosity was stronger in anxious individual, intrinsic religious attitudes correlated with lack of anxiety. Baston and Ventis (1982)[135] even claim that religious experience involves creative problem solving to deal with personal crisis, and that there is a surrender to a new vision of life. In general, religious can solve the problem of death and the uncertainty after death to some extent. Once a person believes in God and become a Christian, God will take away all his/her guilty and they are able to enter heaven after death, it is a concept of "reborn" in Christianity. When they died, they will enter heaven, which is a place without tears but only happiness. To conclude, people have a religious belief seems happier than the others. However, does this concept apply to Chinese? It would be discussed later.

It has been proved by researchers that religion does bring people better health, including physical and mental health. The World Heath Organization gives a positive definition of heath. "Health is a state of complete physical, mental and social well being and nor merely the absence of disease or infirmity." Health is related to the concept of well being, including successful adaptation to one's environment[136].

For physical health, Comstock and Partridge (1972)[137] has done a research on this topic. They study the mortality rates for the population (about 55,000 in all) of part of Maryland in 1960 to 1964. They found that those went to church once a week or more had much lower death rates than those who went less often, or not at all. It is

[133] Argyle, M. (1992), "The Social Psychology of Everyday Life", London : Routledge.
[134] Baker, M., & Gorsuch, R. (1982), "Trait Anxiety and Intrinsic-extrinsic Religiousness." Journal for the Scientific Study of religion", 21, 119-122.
[135] Baston, C. D. (1975), Rational Processing or Rationalization? The Effect of Disconfirming on a stated Religious Belief, "Journal for the Seientific Study of Religion", 21, 119-122.
[136] Mak, J. (1992), An Estimate of the Incidence of Mental Disorder in Hong Kong, "The Development of Social Indicators Research in Chinese Societies", Ch. 15, pp. 251-255.
[137] Comstock, G. W. and Partridge, K. B. (1972), Church Attendance and Health, "Journal of Chronic Diseases", 25, 665-672.

because they have a lower chance suffering from heart disease, cancer, etc. or committing suicides. Spilka (1988)[138] finds that religious people were still in better health when smoking and drinking had been taken account of statistically. Comstock and Partridge (1972)[139] explain it in a biological way, they suggest that religious people have a longer life because of they have a peace of mind and release of tension in everyday life, which can keep their pulse and blood pressure normally.

The vast majority of mental health problems are related to neurosis, depressive and anxiety states. They do not lead to long term admission to psychiatric hospitals but significant affect the individual's relationship and functioning in life, and affecting his capacity of happiness. However, significant amount of mental disorder and emotional distress is suffered by people in the community. Only a fraction of the need is met by hospitalization. The issue of mental heath is complex and controversial because there is often a misconception that mental health problems mean the equivalence of mental illness. Results of different research on the effect of religion on people's health vary with the different means of measure[140]. Maton (1989)[141] suggests that perceived support from God had a positive effect in reducing depression, and sustaining self esteem and emotional adjustment, in people that were under high stress, but it had no such effects on those not under stress. In other way round, Pargament (1988)[142] suggests that religion can help people in troubles by several means. First, it helps them to collaborate with God to solve problem. Second, religious people tend to waiting for solutions from Go. Finally, they emphasizing the freedom Gods give to direct their lives. Another important point was brought out by Durkheim (1915)[143]. He pinpoints that religion also reduces the rate of suicide. He thought that this was because of the social integration provided by religion. For example, when going to church, Christian can

[138] Spilka, B., Hood, R. W. & Gorsuch R. L. (1985), "The Psychology of Religion", Englewood Cliff, NJ: Prentice-Hall"
[139] Comstock, G. W. and Partridge, K. B. (1972), Church Attendance and health, "Journal of Chronic Diseases, 25, 665-672.
[140] Argyle, M. (1992), "The Social Psychology of Everyday Life", London : Routledge.
[141] Maton, K. I., (1989), The Stress-Buffering Role of Spiritual Support: Cross-Sectional and prospective Investigation. "Journal for the Scientific Study of Religion", 28, 310-323.
[142] Pargament, K. I., Kennell, J., Hathaway, W., Grevengoed, N., Newman, J. and Jones, W. (1988), Religious and the Problem-solving Process: Three Styles of coping, "Journal for the Scientific Study of Religion", 27, 90-109.
[143] Durkeheim, E. (1915), "The Elementary Forms of Religious Life". London: Allen & Unwin.

express their own feeling and difficulties to others. As the meeting is regular, say, every Sunday, they would have a greater chance to release their pressure by speaking to others.

In Chinese society, there is also religious belief such as Buddhism and Taoism. However, those religious believe human being will first enter to hell after death before starting a new life. They also suggest that people will become any living including insects and animals for their new life. Therefore, one can see that there is a higher degree of uncertainty of after death concept in Chinese religious than Western religious.

Francis (1985)[144] argues that religious have very little, or no correlation with personality. Although religious cannot change one's personality, it can made people live happier, healthier and think more positively. All of the above literatures well explain why religious people are always having a lower level of pressure than the others, and why they can free from anxiety and is able to live happier.

The idea of comfort zone

Another argument for having happiness may be related to the concept of "comfort zone". Everyone has his/ her comfort zone. People tend to stay within their own comfort zone rather than breaking through it, i.e. trying new things. Research by King (1998)[145] shows that when people continually imagine and write about achieving their goals, they tend to become more optimistic and satisfied with their lives than do those who write about traumatic events. She observes that talking or writing about the most hopeful and fulfilling aspect of our lives can boost our sense of personal well being. People can actually improve their life satisfaction by always try doing things better. Psychologist Phil McGraw (2002)[146] calls it, "rising beyond your raising." In other words, people must rise beyond the point their parents could raise them. That is

[144] Fransis, L. J. (1985), Personality and Religion: Theory and Measurement, In L. B. Brown (ed.), "Advances in the Psychology of Religion." Oxford: Pergamon.
[145] Lisa Linedeman (1998), "Emotion Toolkit", http://emotiontoolkit.com/posthink.shtml
[146] Micheal E. McCulloughm (2002), The Grateful Disposition: the Conceptual and Empirical Topography, "Journal of Personality and Social Psychology", 82(1), 112-127.

one of the finest expressions of gratitude and homage one can offer to one's parents. The "feel good" people try to make others happy with the mantra, "I'm good enough. I'm smart enough and doggone people like me." But one should not stop there. People have got to do better than what they can already do. This means thinking beyond our excuses and fears and looking past the weaknesses over to one's strengths. Human being is subjective well being (Diener, Lucas and Oishi, 2002)[147] and how much we like ourselves depends on what side of our thinking is focus on. After we have achieved the goals set by ourselves, our life satisfaction should be increased. Literatures have found that people that have intrinsic aspiration, e.g. love, social service, is happier than those having extrinsic aspiration, e.g. money and social satisfaction (Kasser and Ryan, 1996[148], Chan and Joseph, 2000[149]). It is because intrinsic aspiration can achieve self-actualization, which is deeper and more long lasting.

The performance of Hong Kong people in achieving happiness

The author has addressed several ways to achieve a happy life. However, Hong Kong people seem fails to do so. When concerning the method of positive thinking, it has been said that it requires substantial training. For religious people, they go to church or temple regularly. For people that would like to go beyond their comfort zone, they should have time and confidence to explore. Therefore, one can observe that happiness does not appear naturally, it requires effort and time. Apart from the above methods, all other ways to achieve happiness takes up people time as well.

Nowadays, Hong Kong people become more and more concern on their health and their living quality. Wong (2003)[150] studies how happy Hong Kong people are. He set up questionnaires to investigate the happiness of different people coming from different backgrounds. The index is ranged from 1 to 10, with 1 the lowest and 10 the

[147] C. R. Snyder, Shane J. Lopez (2002) Handbook of Positive Psychology.

[148] Kasser, T. and Ryan R. M. (1996), Further Examining the American Dream: Differential Correlates of intrinsic and extrinsic goals, "Personality and Social Psychology Bulletin", 22, pp. 280-287.

[149] Chan, R. and Joseph, S. (2000), Dimensions of Personality, Domains of Aspiration, and Subjective Well Being" Personality and Individual Difference, 28, pp. 347-354.

[150] Wong, S. W. (2003), How Happy are You? A Study on Happiness Index of Hong Kong People 2003. Department of Applies Social Studies, City University of Hong Kong. Unpublished pamphlet.

highest. In his questionnaire results, the lowest make people are in the age group of 15-24, followed by the age group of 35-44. The happiest group is people with age over 65. He claims that it is because teenagers have to face different problems such as public examinations and careers opportunities. Middle aged people have to work hard and got pressure from work, on the other hand, they also have to take care of their children after finishing their job. Therefore, although there is a rising concern for happy living, the majority of Hong Kong people are still busy. They do not have time and effort for doing extra. "Time is money" in an international financial centre, what Hong Kong people most concern is money, it is rather hard for them to sacrifice their valuable time to think of themselves deeply to achieve happiness. Therefore, when difficulties or stress comes, Hong Kong people are easily to collapse and commit suicide.

Effect of stress on health

Since 1930s, psychologists have been interested in the effects of stress. Selye (1956)[151] defines stress in terms of harmful stimuli, but the concept was soon broadened beyond physical harm to include psychological stress.[152] Argyle (1992)[153] regards stress as a source of mental illness. However, significant amount Hong Kong people suffered from mental disorder and emotional distress. Only a fraction of the need is met by hospitalization. The issue of mental heath is complex and controversial because there is often a misconception that mental health problems mean the equivalence of mental illness. The vast majority of mental health problems are related to the so called neurosis, depressive and anxiety states which usually do not lead to long term admission to psychiatric hospitals but significant affect the individual's relationship and functioning in life, affecting, in essence, his capacity of happiness. The concern of stress on physical health is then raised, such as malignant neoplasms (cancers) and heart disease. They are not only from infections or biological causes, but also from the effects of stress. In recent years, cancers and heart diseases become the top and the second leading causes of death. Nearly half of death cases are because of

[151] Selye, H. (1956)," The Stress of Life", New York: McGraw-Hill.
[152] Lazarus, R. S. (1966), "Psychological Stress and the Coping Process", New York: McGraw-Hill.
[153] Argyle, M. (1992), "The Social Psychology of Everyday Life", London : Routledge.

these two causes in year 2002.[154] Therefore, Hong Kong people are suffering from high level of stress making these two diseases become top killers in Hong Kong.

When stress comes across, human being would threaten and tries to cope with the situation. If the coping process is successful, the treat can be reduced or eliminated (Epstein & Meier, 1989[155]; Taylor Bunnk & Aspinwall, 1990[156]; Hendrix, Stell and Schultz, 1987[157]). Before stress being eliminated, it brings immediate physiological effects (e.g. higher blood pressure and heart rate) and emotional relations (e.g. depression and fear) to human. In a long run, stress suppresses the immune system (Jennott and Lockem, 1984)[158] and lead to mental illness. Totman et al. (1980)[159] find that those people who have exposed to stress in the past 6 months are more likely to become ill.

The most common sources of stress are job related and life related. The former one includes the work nature and the supervisor's behavior while another deal with parent-offspring problems. In deed, there are many events occurring in the course of daily life exerts pressure on us, for example, walking on a crowd street or driving in a heavy traffic. Schleifer et al (1983)[160] claim that with more serious disruption, such as the death of a loved one, brings great pressure to one being. Lazarus & Folkman (1984)[161] suggest that effects of stress increase the chance of illness, both physically and psychologically.

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[154] Department of Health, HKSAR (2003), "Department of Health Annual Report 2002/2003", Hong Kong : Department of Health. of Health, HKSAR.
[155] Epstein, S., & Meier, P. (1989), Constructive thinking: A Board coping Variable with Specific Components. "Journal of Personality and Social Psychology", 57, 332-350.
[156] Taylor, S. E., Bunnk, B. P. & Aspinwall, L. G. (1989), Social Comparison, Stress and Coping, "Personality and Social Psychology Bulletin", 16, 74-89.
[157] Hendrix, W. H., Steel, R. P. & Schultz, S. A. (1987), Job Stress and Life Stress: Their Causes and Consequences. "Journal of social Behavior and Personality", 2, 291-302.
[158] Jemmott, J. B., and Locke, S. E. (1984), Psychological Factors, Immunology Mediation, and Human Susceptibility to Infectious Diseases: How Much do we Know?, "Psychological Bulletin", 95, 78-108.
[159] Totman, R. , Kiff, J., Reed, S. E. and Craig, J. W. (1980), Predicting Experimental Colds in Volunteers from Different Measures of Recent Life Stress. "Journal of Psychosomatic Research", 24, 155-163)
[160] Schleifer, S. J., Keller, S. E., Camerino, M., Thornton, J. C., & Stein, M. (1983). Suppression of Lymphocyte Function Following Bereavement. "Journal of American Medical Association, 250, 374-377.
[161] Lazarus, R. S. & Folkman, S. (1984). "Stress, Appraisal and Coping", New York: Springer-Verlag.

There are ways to modify or reduce the effects of stress and protect ourselves from illness. Roth et al (1989)[162] test the assumption that the negative effects could be reduced by the positive effects of exercise, fitness, and hardiness. A healthy person is more able to fight against stress and therefore, they can less suffering from illness. However, as pointed out before, Hong Kong people are always rush and do not have time to relax. They have low fitness level and easy to become ill especially when they are stressed.

3.3 Concluding Remarks

One can see that graveyard view does not bring hazard to people simply by Feng Shui alone, but by stress and unhappiness it generates. Most of the Hong Kong people are busy. They do not have time to do something that they would like to do. They do not have enough relax which can make them happier. It makes them always in a low fitness level and when stress comes, feeling hard to fight with them and lead to illness.

As discussed before, stress comes in numerous ways. For people living in an apartment facing to graveyard view, they see graveyard everyday. Graveyard does give people a negative message of death, especially in Chinese society, as it creates fears and is regard as a taboo. Therefore, it is also a form of stress and gives an additional volume of stress to people when they come across difficulties and unhappy events. It can be concluded that people living apartment with graveyard view has more stress than other people and thus, have a less healthy body.

Graveyard view affecting people in a psychological way, causing Chinese people reject living in an amenity that carries graveyard view. They require compensation when purchasing it. Apart from this, there are also other reasons to

[162] Roth, D. L., Wiebe, D. J., Fillingim, R. B., & Shay, K. A. (1989), Life Events, Fitness, Hardiness, and Health: A Simultaneous Analysis of Proposed Stress-Resistance effects. "Journal of personality and Social Psychology", 57, 136-142.

explain why the prices of graveyard view amenities are lower than other views. Firstly, most of the ethical Chinese are superstitious. The superstitious comes from the uncertainty after death in Chinese culture. Secondly, although not all Hong Kong people are superstitious, they still reject buying graveyard view amenities because they know the resale power of this kind of properties is not that good as the society are dominated by ethical Chinese. They also require compensation when purchasing a graveyard view properties. These three major reasons explain by graveyard view significantly affect property price. The origin of the effect is Chinese culture and belief. As a result, the effects of graveyard view will apply to any places provided that the ethical Chinese there reached the critical mass.

CHAPTER FOUR

PROPERTY MARKET TREND OF HONG KONG

4.1 High Level of Property Price in Hong Kong

In this dissertation, empirical data from 1992 to 2004 would be drawn to construct the hedonic models. During such a long period of time, Hong Kong has encountered many impacts from special events which may be induces by government's political policy and land supply strategy, economic status or strong inflation effect, etc. Therefore Hong Kong property price, especially, has encountered fluctuations from time to time accordingly. Each month, the Rating and Valuation Department in Hong Kong publishes various price indices to show the property price movement which reflects the performance of the property market. It gives a full picture of Hong Kong property market performance.

Hong Kong residential price usually occupy the top few positions around the world, the main reason behind is because of the imbalance of land supply and demand. In other words, the prices of private residential units are determined by the supply and demand theory in economics. The demand side is rising dramatically after 1997 as many people were emigrated from the mainland to Hong Kong for a better living environment. The high level of demand with the shortage of supply determines Hong Kong high property price, especially in the residential section. For the supply side, it is always a shortage. The HKSAR government, in order to achieve a good financial status by gaining as much as they can through the land auction, she triggers the land selling policy by reducing or even stop supplying land for residential use in slump period but keeps on releasing land in boom period. This act jacks up Hong Kong land prices and residential property prices to even higher levels.

4.2 Property Market Trend of Hong Kong

In this chapter, focus is put on the reasons that lead to the price movement in the selected time frame, year 1992 to 2004. In the following, the author would review the residential property market in Hong Kong from 1992 to 2004.

Usually, a high interest rate would increase the cost of purchasing properties since most of the purchasers bought their houses using the mortgage arrangement. It would lead to increases in property prices. Before 1992, the significant increase in interest rates and rampant inflation rate contributes 21.5% increase in the price level when compare to 1987. Although the happening of the June Forth Student Movement in China has crushed the residential property market heavily, the effect is soon absorbed by the market. There were also speculative activities in the market, the government aims at intervening it by advising the banks to put in place a 70% mortgage. However, it cannot stop the up climbing of property price. At the end of year 1991, the price level was 51% higher than that of the 1989 level. This showed that the demand for housing is still very strong.

With the failure of government intervention, the property market continued to prosper in the year 1992, especially in the first three quarters. The property market is very active. The price level in the third quarter experienced 22.4% increase from the forth quarter in 1991. The HKSAR government then established another measure in the forth quarter of 1992. For every transaction of property, the government would levy stamp duty which shared a certain percentage of the property price, and the extent of the shares depended on the property price. This measure successfully discouraged speculative activities and made the market more orderly. It caused a reduction in the volume of transaction in that quarter. The property price level decreased by 3 % when compare to the first quarter of 1993.

However, the effect of the stamp duty measure is not long lasting. The residential property market became active again at the end of the first quarter in 1993. In

August, major banks imposed restrictions on mortgages which further lower the 70% mortgage ceiling to 60%. The mortgage ceiling is much lower for those properties that were over 5 million dollars. It relieved the speculative activities in property market. However, the luxury domestic market was still active. It is due to the increase in demand by local professionals and expatriates returning from overseas in that year.

Many investors, including individual and major develops, show their confidence in the property market through their fierce bidding in the land auction. Consequently, individual investors were attracted by the optimism shown by developers in the land sale auction. On average, the price level in 1993 had increased from 97 to 108, which is accounted for 10.2%.

The confidence shown by the investors and users at the end of 1993 carries on to the beginning of 1994. The price level has escalated for about 15% within just one quarter. Again, the sharp increase in price level aroused the government and forces her to introduce an anti- speculation measures. A Task Force was set up to monitor the housing supply and property price. After introducing this measure, the price level fell steadily throughout the remaining year. Speculators hesitated to stay in the market and left the market consequently. Apart from the measures introduced by the government, the high interest rates of those Hong Kong major banks also contributes the market correction on the property price level.

After experiencing the upward trend for such a long time, there is market adjustment in 1995 and the residential property market experienced a downturn in the price level. There was a high-level vacancy rate in residential property market due to the rapid growing of the market in the previous years. It forces the developer to slow down the construction progress and reducing the supply of units. The supply of residential units has fallen dramatically by 33.8% from 1994 to 1995. The volume of transactions of properties also dropped from around 93000 in 1994 to about 77000 in 1995. In order to attract buyers, developers sold their stocks with very favorable and flexible term and offered second mortgages. Despite the effort of the government and the developers, the price level did not rebound. The price level of 1995 decreased for further 7.2% when

compared to year 1994.

In view of the inactive market, banks and developers tried their very best to improve the situation. Firstly, banks decrease interest rates for lending. Secondly, fierce competition among banks forces them to offer competitive mortgage terms. It lowers the cost of investment and attracts new buyers. Those flexible payment terms usually come with innovative promotion strategy provided by the developers. Those factors makes the number of transactions in 1996 rose by 70% to 130000 from 77000 in 1996 and the price level, on average, increased 9.2% from the 1995 level. The residential market escaped from the trough in 1996.

The surge in property price in 1996 continued in first half of 1997. The property market underwent a turbulent year in 1997. During that period, the property prices are jacked up by high investment demand, hectic speculative activities, attractive mortgage loan terms offered by competitive banks and a short term tight supply. As a result, prices rocketed 30% during the first of the year. The volume of transaction also reached another peak.

However, when most people were enjoying the fruitfulness of the property market, the whole economy collapsed by an expected financial crisis. Responding to the booming in the property price, the government would like to impose a long term plan to stabilize the market. The Chief Executive announced in his first policy that government intended to stabilize the property prices by increasing the housing supply. It aims at achieving the target of providing 85000 units in the year in 1999. It may be a more effective mean than previous measure such as introducing stamp duty, in stabilizing property prices in a long run. Unfortunately, the Asia financial crisis has made this plan completely failed. Hong Kong, like other counties, started to suffer in October in the year. Many people that have been speculated in the financial market lost a lot of money. Banks, in order to secure themselves, tightened their mortgage loan granting policy and increase the lending rate substantially. Potential purchasers lost confidence and hesitated for entering the property market. As a result, number of transaction recorded is greatly reduced and it also put great pressure on the property prices. Hong Kong's residential

property market experienced a strong compression in the final quarter of 1997. Prices declined sharply and dropped by about 14% in less than two months. The prices of apartments that had surged 34% in the first ten months of 1997, prices dropped back from its peak by 14% in the following two months till December. Rental prices also softened, although theses typically lagged behind the sales market. Towards year-end, secondary market trading dropped sharply. Developers sought out to strengthen their cash positions in the tight liquidity climate, thus pushing prices down further. Residential property prices have fallen by at least 30% from the peak in the May of 1997 and are not at levels of October 1996. The amount of decrease is greatly depending upon the type of property.

Asia financial crisis caused a significantly impact to Hong Kong economy. The nightmare did not end with the passage of the year 1997. It carried through the year 1998. The price of residential property kept on falling. The price of property was halved when compared to the peak level in 1997. Many companies and corporations faced difficulties in generating revenue. In order to survive, they cut the number of staff or their salary. High unemployment rate was encountered in Hong Kong. On the other hand, the high interest rate offered by banks discouraged people to purchase properties. Therefore, people lost their confidence to the economy entirely. As a result, the purchasing power declined and every one hesitated to enter the market. This sudden contraction in demand is not complemented by an adjusted supply. It led to a drastic decrease in property prices. Furthermore, among the transactions in this year, most of them involved the sale of first hand properties. The second hand market was very inactive. Furthermore, given the still weak buyer sentiment and tightened credit environment, developers were opting for a cautions pricing strategy for property launches in 1998. The government was holding to see an average of 85,000 new housing units per year built over the next five years. This target was driven by demographics and is putting additional pressure on prices.

During the downturn of the property market in 1998, competing among private developers in launching new projects was severe. Price wars were inevitable and such impacts also adversely hampered the secondary property market. All private

developers tried to sell out all their investment properties, remaining stocks and defaulted units. It was estimated that a total of 35,000 private residential units were being launched for sale in 1998, of which about 5,000 units were not yet sold and these were brought forward to 1999 as remaining stocks. Hence, the overall property market in Hong Kong entered a viscous cycle of severe cutbacks.

The market became even worse, especially during the last 2 quarters in 2000. The price level has dropped 10% further. In year 2000, although the whole economy seems to be better than before, the property market did not start its recovery. Property price level kept on dropping through out the year of 2001 and 2002. The outbreak of SARS in the first quarter of year 2003 brings the price level to another through, it dropped by another 40% when compared to the price level in the last quarter of year 2000. The price level of May and June in that year contributes the lowest one in the price trend. During the period of SARS, the whole economy collapsed again. People were losing confidence and interest in entering the property market.

Luckily, the effect of SARS was absorbed by the market quickly, the market started to recover since the end of 2003. The property market became active again. The HKSAR Government announced to carry out land sale again. The public has recovered their confidence by the prospect shown by developers in the land sale auction. The property price level bounced back to year 2000 price level in year 2004.

4.3 Concluding Remarks

Reviewing the past decade, before the Asian financial crisis, from 1992, other than during 1994 to 1995, basically housing prices maintained an upward trend. The aftermath of the market through in 1995 was the supply of hosing in the last 3 years was drastically reduced, leading to an enormous price increase from the bottom of 1995.

The Asian financial crisis brought Hong Kong property market to the through.

Salary reductions, bankruptcies and downsizing were results of this destructive storm. Therefore, even though there was mild rebound in the last quarter of 1998, the prospect of the residential property market remains gloomy. The outbreak of SARS brought the price level to the bottom but the market recovered soon. The price level kept rising due to the good prospects shown by the developer in bidding the land in land auctions. The market is entered into another cycle.

During this decade, the property market covers both the boom and slump periods. These fluctuations are favorable to this study, as we have to test how graveyard view brings effect to property price in different market conditions. Another important implication of the trend of the property market is that the use of price deflator is necessary in this dissertation. As one of the aims of this research is to find out the impact of graveyard view on the penalty of residential property investment, other factors have to be kept constant. Since there is a time effect incorporated in the data, it ought to be removed. The method of removing the effect would be discussed in the next chapter.

CHAPTER FIVE

DATA SOURCES AND PROCESSING

5.1 Sources of Data

The selection of data and such data sources of the case study of Hong Kong mainly base on the following,

1. Economics Property Research Centre (EPRC)
2. Hong Kong Property Review
3. Location map of Riviera Garden and South Horizon (Phrase 1).
4. Site Visit

EPRC database contains transaction records of Rivera Garden and South Horizon (Phrase 1) registered in Land Registry. These transactions are recorded based on their agreement. However, every transaction may involve more than one agreement, such as the assignment and sale and purchase agreement. The repeated transactions are required to be deleted to avoid double counting. In this research, all records of assignment have been deleted with only the records of sale and purchase (S&P) agreement left behind for investigation. The rationale behind is that not every transaction involves an assignment agreement, especially for transactions during boom period with active speculative activities. During boom period, truncations perform so intensive that properties always transacted to another party before the signing of the assignment agreement. For the case of Hong Kong, this sort of boom period may be the one in 1997, just before the burst out of Asian Financial Crisis. Base on this reason, only those S&P records cam fully illustrate all the transaction involved in those two subjected estates.

EPRC database provides us with relevant information for this study. It

definitely benefits the study by shortening the data searching time. For each of the transaction record, it provides relevant information such as the property's transaction price, transaction date, the date of the issue of Occupation Permit, the Gross Floor Area and the location of that particular unit. That information helps figuring out all structural variables in the model, i.e. AGE, FLOOR LEVEL and GFA.

The main shortcoming of those transaction information provided by EPRC is that it does not describe the view of that particular amenity. Therefore, site visits are conducted in order to obtain information about the quality of view. Due to security reason, the author is not possible to access the building and amenity one by one and survey their view, the author can roughly figure out the view by standing in the same orientation of the building with the help of map and the location plan. The view is assumed to be equal for the same building sharing the same orientation. If the author find that there are variables that can affect the view, e.g. such as blockage of view by other structure, adjustment would be made accordingly.

5.2 Data Adjustment for Time

In this study, one of the dependent variables is the price of a particular apartment. Those data need some adjustments before they are used in the model. As mentioned earlier, transaction records include properties sold over 22 years, "time effect" would be asserted on the data. One can figure out from the previous section that the property market in Hong Kong respond very quickly and fluctuate a lot due to the its special political, geographical situation, and the financial policy such as open market policy adopted by the government. Structural, locational and neighborhood variables mentioned in Chapter 2 are not able to capture this effect. Together with the high responding rate of the market, changes of price level occur from time to time, it does not occur within a yearly period but also within a quarterly or even monthly period. Therefore, data adjustment is necessary in order to make the data more accurate and reflecting the real price.

In this study, the author makes use of the price deflator to solve this problem as the first attempt. It is used to deflate the transaction prices at different time period to a common base (period) so that the effect of time on property can be eliminated. Based on the reasons mentioned in the previous paragraph, The Private Domestic (Price Indices for Selected Popular Development) – Monthly Price Indices[163] published in the Hong Kong Property Review[164] would be used instead of quarterly or yearly price indices. Moreover, both Riviera Garden and South Horizon are housing estates that always be included in the indices, thus the mentioned price indices is more suitable. Therefore this index is used in this study instead of other index published by the Rating and Valuation Department. The monthly price index, apart from this category, there are also another two main groups. One of them is calculated from small and medium domestic properties while the other one is calculated from large domestic properties. If the saleable area (GFA) of those properties are less than 99.9m^2, they will then fall into the former group and those that are larger than 99.9 is categorized into the latter one. The above two groups can be further divided into two subgroups. One group of index is calculated from urban properties while the other one is calculated from the New Territories properties. Therefore, one should choose the right class of index according to where the subject buildings locate and how large they are.

As the Private Domestic (Price Indices for Selected Popular Development) – Monthly Price Indices are just updated to August 2004 by the Rating and Valuation Department, transactions after that month is being discarded for easy comparison.

[163] This monthly price index is based on the analysis of price paid for completed flats in 50 estate developments in Hong Kong. It is a weighted average index of the 50 developments. Further details can be found in the Technical Notes 14 of Hong Kong Property Review. This index is 1995 based.
[164] Rating and Valuation Department, Hong Kong Property Review: Various Issues, Hong Kong Government Printer.

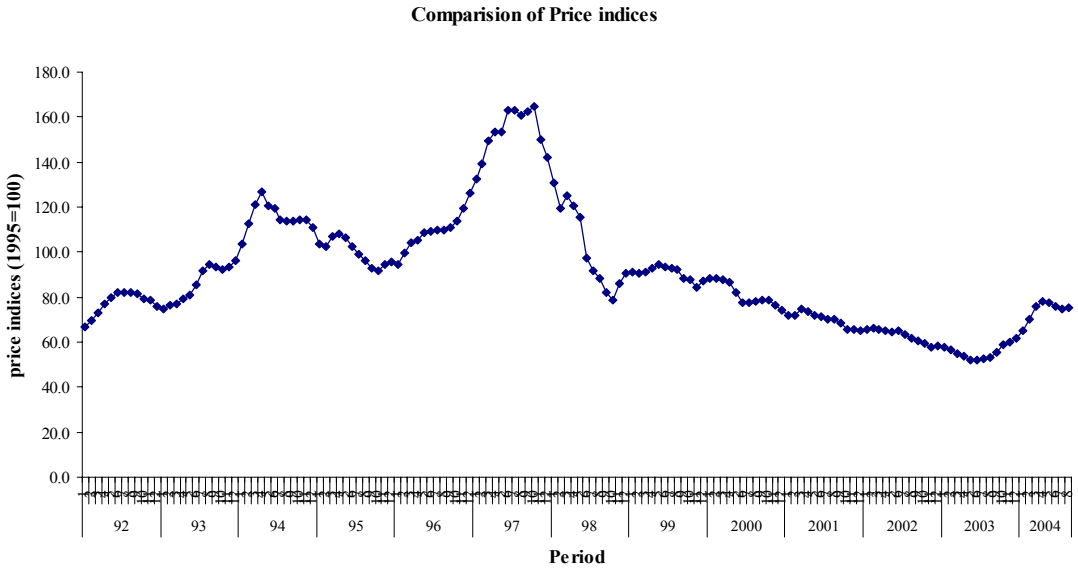


Table 1. Comparison of the change in price indices form year 1992 to 2004.

One can clearly observes from the graph that the index has fluctuated a lot within the time frame. It indicates that the property price does not stay constantly but escalating considerably with its high sensitivity to time. This time effect contributes quite a significant part to the property price and therefore, price deflator is used to eliminate the bias. After adjusting the data by the price deflator, the variation price should only be due to the purchaser's preference of the property.

Apart from the price indices, the author employs another mean to capture the time effect. In the house price index literature, Clapp and Giaccotto (1992)[165] and Gatzlaff and Ling (1994)[166] state that hedonic estimation commonly utilize the explicit time variable approach, in which data on dwelling characteristics are pooled across time periods and time is included as a number of dummy variables. The main disadvantage of this is that it involves a lot of dummy variables, especially when the time interval is in terms of month or day, since one dummy variable is needed for every time interval. However, this method can capture all the time effect by the time dummies.

[165] Clapp, J. M. and C. Giaccotoo (1992), Estimating Price Trend for Residential Property: A Comparison of Repeat Sales and Assessed Value Methods, "Journal of Real Estate Finance and Economics", 5, pp. 357-374.
[166] Gatzlaff, D. H. and Ling, D. C. (1994), Measuring Changes in Local House Prices: An Empirical Investigation of Alternative Methodologies, "Journal of Urban Economics", 35, pp. 221-224.

5.3 Outline of Models in This Study

In this study, six models are set up for each set of sample data in Hong Kong. Those sample areas chosen for this study are Riviera Garden in Tusen Wan and South Horizon (Phrase 1) in Ap Lei Chau. The former on is located in New Territories while the latter one is found in Hong Kong Island, which is an urban area. However, in all 3 cases, condominiums are still homogeneous in nature. It would be further discussed in next chapter.

5.4 Selection of Variables

Megbolugbe (1989)[167] indicates that the identification of correct independent variables share the same importance of inserting correct dependent variables into the model. Therefore, before discussing the functional form used for the study. The author is going to identify the main dependent and independent variables in the models.

Dependent variable for model 1 to 5 is the deflated transaction price of the property in HK$ per sq. meter of gross floor area at constant 1995 prices. The data obtained from EPRC contain the nominal transaction price only, not the real price as needed. Hence, price index, which has been described before, is used to deflate the nominal price to real price. The real price is then used as the dependent variable for the four models. In model 6, nominal price would be used instead of deflated price, aims at comparing the differences in the performance of the models by using time dummies and the price deflators.

For independent variables, the most important one under this study is “view”. By obtaining view dummies of different amentias, the implicit prices of graveyard view in different district and cultural background can be known. However, one has to control

[167] Megbolugbe, Issac F. (1989), A Hedonic Index Model: the Housing Market of Jos, Nigeria, “Urban Studies, 26, pp. 486-494.

the effect of other factors that may also affect the property price in the same instance. Residential properties are heterogeneous in nature and it is difficult to conduct the above control. Normally, it would be compensated by introducing different traits such as locational, structural and neighborhood traits in the model. However, the author has chosen another approach to minimize the effect of them by selecting the samples carefully and their nature is relatively homogeneous. Details will be discussed in next chapter.

Each model would have its own set of variables. However, all models would have at least one variable related to the graveyard view in order to study the effect of graveyard view on property prices. The availability of graveyard view would be represented by dummy variables. Interaction terms would also be created in order to study the effect of certain factors on the coefficient of view dummy. The details of the above would be described later.

CHAPTER SIX

IMPLICIT VALUE OF GRAVYARD VIEW

6.1 Choice of Data Sample

Although Hong Kong is small, there are still several graveyards available for this study. They are located in different districts. Due to time and resources constraints, it is quite difficult to study all types of graveyard view in this dissertation. Therefore, decision is necessary to determine which graveyard should be included in this study. The author has chosen two large scale graveyards. These two graveyards have the same name, Chinese Permanent Cemetery. One is near Riviera Garden while the other one located opposite to South Horizon (Phrase 1). Those two are chosen because they are expected that their impact on the nearby housing estate is more significant than the others, giving a better illustration on the effect of graveyard view on property prices. In other words, they should be able to represent the entire population for the effect of graveyard view on Hong Kong property prices. By choosing two estates for investigation, two sets of result would be produced. It allows comparison of two sets results and a more accurate and comprehensive conclusion can be drawn.

After choosing the right estates, data sample would then be chosen correspondingly according to the kind of graveyard view selected. In the first section of this chapter, explanation will be given to the choice of data sample. After that, data control measures would be discussed. Section three and four would be devoted to the selection of variables for the model and the description of data respectively. The last section would show the model set up for graveyard view amenities. Empirical results from the model will be discussed in the next chapter.

In Hong Kong, there are not too many large graveyards. Although most of them are near residential estates, those estates are public housing or single blocks

development and their transaction is not active enough to produce large data set for statistical analysis. Therefore, those areas are out of consideration and it is necessary to study the number of transaction record in the Economic Property Research Centre (EPRC) to see is it substantial to undergo the research. After eliminating those, the author has chosen Riviera Garden at Tsuen Wan, New Territories and South Horizon (Phrase 1) at Ap Lei Chau, Hong Kong Island.

Riviera Garden is enclosed by Wing Shun Street and Tsing Tsuen Road, Tusen Wan. Rambler Channel provides sea view to this amenity and the Tsing Kwan highway connects the estate with Tsing Yi. Some of the amenities are facing the Tsuen Wan Chinese Cemetery and the Kwai Chung Crematorium. Location map is provided in Appendix 2.

For South Horizons, it is located at Ap Lei Chau in Hong Kong Island. Similar to Riviera Garden, it is opposite to the Aberdeen Chinese Permanent Cemetery. However, there is Aberdeen West Typhoon Shelter between the cemetery and the estate. Therefore, amenities that are facing the graveyard will be served by sea view first as it is closer to the estate than graveyard view, as shown in Appendix 4.

As discussed before, transactions of Riviera Garden and South Horizon are more active than other public estates and single block developments. They are both large private housing estate with better facilities and higher quality of property management services. It provides a better environment and higher quality for living. Hence, there are more transactions than those single block developments. Furthermore, most people living in public estates are having financial constraints. Government has subsidized them for buying their own property. They seldom sell their houses. The market of public estate is so inactive that the transaction records are not enough for analysis. Riviera Garden and South Horizon can provide more data within the sample selected and hence the empirical results generated would be more reliable and able to represent the entire group of graveyard view amenities.

6.2 Data Control

According to Chapter 5, data are retrieved from the EPRC data base. There are 15924 records for South Horizon and 6034 records for Riviera Garden between January 1992 and August 2004. For each set of data, information about the structural variables is given, such as the age, floor level and GFA of the properties. However, information about the locational and neighborhood traits is not included in the model. There are two methods to solve this problem. The first approach is to identify those locational and neighborhood variables that existed across the data sample, followed by searching relevant information about the variables from other sources. It includes map analysis and site investigation. The problem can also be solved by setting up data control in such a way that the effect of those locational and neighborhood variables would be substantially reduces or eliminated. By adopting either one of those approaches, variations in property prices are largely due to the remaining factors that are under investigation.

In this dissertation, the author has adopted the latter approach since the main focus of this model is to quantify the implicit values of graveyard view amenities. Focus should be shifted to the impact of view variables rather than those locational and neighborhood variables. The relatively homogenous nature of those selected samples is achieved by careful data control and selection. Buildings chosen must be located in the same housing estate and within a certain distance from those important places of the housing estate, such as bus terminus and shopping centre.

Based on above criteria with the consideration of the information got from site visit and the location map (as shown in Appendix 2 to 4), the author has chosen the entire estate for investigation in order to compare the effect of graveyard view properties to sea view and normal view properties. Riviera Garden has 20 blocks of buildings while South Horizon has 36 towers in total. The reason of including all the towers for observation is too enlarge the pool of data sample. With large data sample, results generated would be more accurate and dependable. During site visits, the author

found that facilities such as basketball court, shopping centre and bus station are always located near the centre of estates and are easily conveniently accessed from each block of building in the estate. Locational and neighborhood variables are more or less homogenous within the same estate. More detailed explanation would be listed below.

6.2.1 Control on Locational Factors

Most literature acquainted in Chapter 2 includes access to CBD and distance from shopping centre as locational variables. When concerning the accessibility to CBD, Hong Kong people usually rely on bus and MTR. Tsuen Wan MTR station is quite far away from Riviera Garden. It takes lengthy time to walk there. Therefore, residents depend on bus or minibus to reach the MTR station. There is only one bus terminus in Riviera Garden. This terminus is therefore regarded as a point of reference. The location map of Riviera Garden in Appendix 2 shows that those selected buildings are of similar distance from the bus terminus. After the site visit, the author found that all the above selected buildings are within five minutes walk from the bus terminus. Therefore, the traveling time to the bus terminus from the subject building or the distance between them is quite similar. The effect of accessibility to CBD on property price is therefore, largely reduced.

Apart from the ease of traveling, the accessibility to the shopping centre is another key factor that affects the property price. There are both commercial complex and recreational facilities within Riviera Garden, located on the top of the bus terminus. Thus, all buildings are kept constant with respect to this variable. Retail shops in Riviera Garden are located evenly on the podium floor around the whole housing. The podium aims at connecting different towers together. Residents are able to access to different retail shops easily and so the locational effect carried by the accessibility to the retails shops are also minimized. Major shopping centres in the districts are all located in the town centre which is near to Tusen Wan MTR station. All residents have to travel by bus or minibus to get there. Therefore, the ease of reaching other shopping centre outside the estate is again depends on the distance between the subject building and the bus

terminus. As a result, the factor concerning the accessibility to shopping centres is kept constant.

South Horizon shares similar homogeneous locational and neighborhood characteristics with Rivera Garden. However, instead of evenly distributed shops around the estate, there is a major shopping centre located in the centre of the estate. It is easily accessed by residents from every tower. Furthermore, as Ap Lei Chau is an island, residents need to depend on bus to travel to areas outside Ap Lei Chau. There are totally six bus stops, located at Old Wing and New Wing, South Horizon Phrase 1, Phrase 2, Phrase 3 South Horizon Drive and Lee Nam Road, and Phrase 4, the Oasis. The exact locations of those bus stops are shown in Appendix 5. Buses travel around the estate and residents take similar time and get access to the most nearby bus stop.

6.2.2 Control on Neighborhood Factors

As mentioned earlier, the author has not included neighborhood variables in the model. Referring to Chapter 3, common variables included by most local researchers include SCHOOL[168], ESTATE[169] and FACILITY[170]. The data sample chosen must be able to minimize the effects of the above three neighborhood factors on property prices.

As the buildings for each model are all chosen from the same housing estate, Riviera Garden and South Horizon, each of them are subject to same kinds of neighborhood facilities such as school, playground, tennis courts and swimming pool. All of them can be easily reached by residents of that estate. Therefore, the neighborhood factors are minimized and it is not necessary to take neighborhood factors into account.

[168] It indicates the presence of school.
[169] It indicates is the subject property a housing estate residential unit.
[170] It indicates the presence of recreational facility, e.g. swimming pool and tennis courts.

6.3 Selection of Variables

As discussed in Chapter 5, the choice of variables is very important when researcher constructing their model. In this chapter, it comes to actual practice for selecting suitable variables for this model. Before doing so, aims of the model will be discussed first.

6.3.1 Aim of this Part

The models general have the following aims,

1. To quantify the implicit values of graveyard view.
2. To differentiate graveyard view into different quality categories and find out the implicit values of different quality of view, with an attempt to criticize the use of only one generic view variable that combines all view properties into a single category, as most researchers did.
3. To test the volatility of graveyard view amenities
4. Testing the effect of graveyard view on property prices during boom and slump period

6.3.2 Variables Selected

Dependent variables

Dependent variables include Nominal Price (NP) and DP (Deflated Price). Nominal price is the price of the property at the date of transaction. Deflated Price is the deflated Nominal Price, reflecting the "real" price of property. The method of deflating the transaction prices is very simple, prices are all deflated by the sale price index with respect to the transaction quarter and year and the class of properties. The deflated transaction price is then free from the inflation or time effect because all the sale price index has the same base year 1995, meaning that all monetary figures are in 1995

dollars. All prices will be at the same price level. Table 2 lists the monthly price index used in this study. The reason for choosing this price index is discussed in the previous chapter.

The property price in present value terms at the tender price level of base period is

$$C = S*100/T$$

Where C = Property price in present value terms in 1995
S = Nominal Price of the Property
T = Quarter tender price index of the transaction year

Table 2. Private Domestic (Selected Popular Developments) Monthly Price Index – Urban

Year/ Month	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1	66.6	74.8	103.4	103.8	94.6	132.2*	130.8*	91.2	88.2	72.1	65.7	57.5#	65.3
2	69.8	76.2	112.6	102.3	99.7	139.1*	119.4*	90.8	88.4	71.6	66.0	56.4#	70.5
3	73.3	77.0	121.4*	107.1	103.9	149.6*	125*	91.1	87.9	74.4	65.8	54.9#	75.7
4	77.0	79.2	126.7*	108.3	105.1	153.5*	120.5*	93	86.7	73.5	65.1	53.7#	78.3
5	79.9	80.7	120.7*	106.4	108.4	153.2*	115.6	94.8	82.1	71.7	64.8	52.2#	77.8
6	81.9	85.6	119.6	102.4	109	163.2*	97.1	93.5	77.5	71.5	64.9	52.2#	76.0
7	82.3	91.7	114.1	98.9	109.7	163.1*	91.9	92.8	77.5	70.4	63.4#	52.8#	74.9
8	82.2	94.5	113.9	96.3	109.7	160.9*	88.4	92.3	78.3	70.0	61.9#	53.4#	75.5
9	81.3	93.7	113.9	93.1	110.9	162.3*	82.1	88.2	78.7	68.5	60.5#	55.3#	
10	79.3	92.2	114.4	91.6	114	164.9*	78.8	87.6	78.9	65.8	59.2#	58.6#	
11	78.6	93.4	114.6	94.3	119.4*	149.9*	86	84.6	76.3	65.5	57.8#	60.1	
12	76.1	96.4	110.8	95.5	126.4*	142.3*	90.5	86.9	74.1	65.3	58.1#	61.7	

* PEAK periods # BOTTOM periods

Independent variables

As discussed in Chapter 2, variables can be classified into structural, locational and neighborhood. However, it is not necessary to include locational and neighborhood variables in this study, the method of minimizing those effects have been discussed earlier. The remaining variables need to be included would be view variables and structural variables. The details description of those variables will be discussed in the coming section.

Dummy variables

For all models, there would be dummy variables to capture the structural characteristics of the property. They are lucky floor number (LF), sea view (SV), graveyard view variable (GV), full graveyard view (FGV) and partial graveyard view (PGV).

LF = 1 if the floor contains number 8 (i.e. 8, 18, etc.), 0 otherwise.
SV = 1 if the property has a sea view, 0 otherwise.
GV = 1 if the property has a graveyard view, 0 otherwise.
FGV = 1 if both the dinning room and the bedroom of the subject property has a graveyard view, 0 otherwise;
PGV = 1 if the bedroom of the subject property has a graveyard view, 0 otherwise.

For dummy variables related to time, they include Ti, PEAK and BOTTOM,

Ti[171] = 1 if transaction occur in that particular period, 0 otherwise.
PEAK[172] = 1 if the monthly price index of a particular month is higher than 118.82[173], 0 otherwise.

[171] Ti represent the time dummies of that particular transaction periods
[172] PEAK represents periods that are classified as boom periods
[173] 18.82 is calculated from 91.04 x 1.3

BOTTOM[174] = 1 if the monthly price index of a particular month is lower than 63.72[175], 0 otherwise.

Lucky Floor (LF)

Definition of lucky floor is very simple. The floor level would be classified into lucky floor if it includes the lucky number 8. Therefore, 8/F, 18/F, 28/F, etc. will be regarded as lucky floor.

Sea View (SV)

Sea view is included in the models because some amenities in both estates subject to sea view. Only amenities with good quality of sea view would be classified as sea view amenities. One may argue the judgment of how good the sea view is very subjective. The subjective effect is minimized by adopting some rules when determining the quality of sea view. For example, sea view amenities should be closed to the costal line and there should not be tall buildings or trees in front of the amenities to block part its view. For sea view amenities in South Horizon, they are all line across the costal line and there is not development or tall tress to hide the view. Therefore, low floor levels are able to access sea view. However, careful judgments are carried out as there are schools and tall tress along Yi Hong Street. Amenities with floor level 1-3 of Block 1&2[176] will not regarded as enjoying the sea view.

Graveyard view (GV)

In stage 1, the author needs to deicide whether the amenities subject to graveyard view or not. The method adopted is just the same as measuring sea view. In Rivera Garden, views of some lower floors amenities are blocked by the Tsing Yi Bridge and tall trees in front of them. Although they are facing the cemetery, they would

[174] BOTTOM represents periods that are classified as boom periods
[175] 63.72 is calculated from 91.04 x 0.7
[176] Block 1 – Hoi Po Mansion, Block 2 – Hoi Chu Mansion

not regard as graveyard view amenities. It includes Block 20-22[177] with floor level 1 to 3.

In stage 2, the author would further classified graveyard view into different quality. The purpose of this is to minimize the subjective judgment on the quality of view as it may lead to biased results. Therefore, in this study, the author employs more objective measured on the classification of the quality of graveyard view. For both Riviera Garden and South Horizon, graveyard view amenities can be classified into two classes, full graveyard view and partial graveyard view.

Full Graveyard View and Partial Graveyard View (FGV and PGV)

In both estates, there are two types of property which can access to graveyard view. One type is that both the dinning room and bedroom are facing the Tsuen Wan/ Aberdeen Chinese Permanent Cemetery while the other type has just its bedroom facing the graveyard. When a property has its dinning room and bedroom subject to the graveyard view, it is classified as full graveyard view. A property would be classified to partial graveyard view if only its bedroom subject to the graveyard view. In other words, the quality of graveyard view is mainly determined by the accessibility to graveyard view.

The rational of using above categorization is twofold. First, the window size of the dinning room is usually smaller than those in the bedroom. The accessibility to graveyard view is higher. The impact of degree of graveyard view that a property absorbed will be larger in dinning room than in bedroom. Furthermore, residents used to spend more time (excluded the time for sleeping) in the dinning room than in the bedroom. The quality of view in the dinning room should be more important than the bedroom and it is believed that the impact of graveyard view in dinning room is more significant than those in the bedroom. The above rules provide more objective judgment on the quality of graveyard view.

[177] Block 20 – Hoi Kwai Court, Block 21, Hoi Yin Mansion, Block 22, Hoi Yue Court.

As discussed earlier, the chosen blocks are all located in the periphery of the estate. Therefore, the problem of blockage of view suggested by Benson et al (1998)[178] is solved by the careful selection of the data sample.

The following dummy variables would be used in stage 2,

1. FGV = 1 if both the dinning room and the bedroom of the subject property has a graveyard view, 0 otherwise;
2. PGV = 1 if the bedroom of the subject property has a graveyard view, 0 otherwise.

With the omitted category properties with normal building view.

In stage 2, the author is going to test empirically whether the FGV brings a more serious penalty than PGV, in order to explain the significant of cultural effects on property prices.

Time Dummy (Ti)

In reality, price levels of Riviera Garden and South Horizon fluctuate more volatile than other popular estates selected by the Rating and Valuation Department. The introduction of time dummy is for capturing the bias of the monthly price indices developed by Rating and Valuation Departments. Ti equals 1 if the transaction takes place during that particular period, 0 otherwise. For example, the value of T_2 is 1 if transactions took period in February, 1992.

Peak and Bottom Period (PEAK, BOTTOM)

In order to classify a period that is boom, normal or slump, the author has adopted the following method. The first step is to find out the average monthly price

[178] Benson, E. D., Hansen, J. L., Schwartz, A. L., and Smersh G. T. (1998), Price Residential Amenities: The Value of a View, "Journal of Real Estate Finance and Economics, 16(1), pp. 55-57.

index of Rating and Valuation Department within the time frame under investigation (1/1992 to 8/2004). The reason for choosing marketing price index but not individual estate price index is that it reflects the overall market performance and it allows comparison between different estates within the same boom and slump period time frame.

Table 3. Descriptive Statistics of Private Domestic (Selected Popular Developments) Monthly Price Index – Urban, within the time frame of 1/1992 and 8/2004

	Monthly Price Index
Mean	91.04342
Median	87.25000
Maximum	164.9000
Minimum	52.20000
Std. Dev.	26.21114
Observations	152

The above table shows that the mean of the price index is 91.04. After finding the mean value, the author has to set criteria for defining boom period and slump period. If the monthly price index of a particular period is above 30%[179] of the 91.04, that period would be classified as boom period (PEAK). Conversely, if it falls below 30% of the mean, that period would be classified as slump period (BOTTOM).

Therefore, for the dummy variables PEAK and BOTTOM,

1. PEAK = 1 if the monthly price index of a particular month is higher than 118.82[180], 0 otherwise.
2. BOTTOM = 1 if the monthly price index of a particular month is lower than 63.72[181], 0 otherwise.

As indicated in Table 2 in Chapter 5, periods that have been classified as PEAK include periods between 3/1994 – 5/1994 and 11/1996 – 4/1998. Periods that have been classified as BOTTOM are those between 7/2002 – 10/2003.

[179] 30% is decided after considering the descriptive statistics of monthly price index. The author aims at leaving about 15% of those 152 periods for the variables PEAK and BOTTOM.
[180] 18.82 is calculated from 91.04 x 1.
[181] 63.72 is calculated from 91.04 x 0.7

In general, those peak periods are all before the Asian Financial Crisis while those bottom periods are mainly brought by the effect of Asian Financial Crisis and outbreak of SARS in the 1st quarter of 2003.

Structural Variables

There are three structural variables in both models. They are age, floor level and Gross floor Area (G.F.A.). They are the most common structural variables used by researchers, especially local researchers. They are also the three main structural variables which contribute significantly to the variations in property prices. Moreover, the above three variables can be readily obtained from the EPRC data base.

Age

AGE is included in the models to reflect how old the property was at the transaction date or when the Agreement for Sale and Purchase (ASP) was signed. Many literatures included this variable. They used year as the unit for the variable. As Hong Kong property market fluctuates a lot, the author is going to measure the property age in a more precise sense. The age of a property is measured by "days' instead of "years", "quarters" or "months". Property age therefore defined as the days elapsed from the date when the occupation permit was issued to the date where the transaction was done or the ASP was signed. For example, the occupation permit is issued at 2-6-1989 and the ASP is signed at 4-1-1993, then the age of the property is 1311 days. By adopting this approach, measurements would be more accurate and more reliable results can be generated by the models.

Floor Level

The variable FL would be used to represent the storey at which the property is situated in a building. It is very simple to determine the floor level. If a building is situated at the 10th floor, the variable FL takes a value of 10.

Gross Floor Area (G.F.A)

The variable GFA is used to represent the gross floor area and hence the size of the property. It is measured in square feet. Say, a property having 1000 sq. feet would have a G.F.A. value of 1000.

Square terms of AGE, FLOOR and SIZE

Square terms are added to test the assumption of linear functional form. If the regression results show that the square terms of any attribute is significant, it means that the attribute is increasing or decreasing in an increasing or decreasing rate and there will be maximum or minimum amount that people are willing to pay for the corresponding attribute.

6.4. Expectation of Variables Coefficients

Table 4. Expectation of variables coefficients

Variables	Definition	Expected Sign
AGE	Age of property (days)	-
AGE^2	Square value of AGE	+
FL	Floor level	+
FL^2	Square value of FL	-
GFA	Gross Floor Area	?
GFA^2	Square value of GFA	?
LF*	Lucky Floor	+
SV*	Sea View	+
GV*	Graveyard view	-
FGV*	Full Graveyard view	-
PGV*	Partial Graveyard view	-

GVxT	Value of GV times transaction time	?
FGVxT	Value of FGV times transaction time	?
PGVxT	Value of PGV times transaction time	?
∑ biTi *	Time Dummy	?
PEAKxFGV*	Values of PEAK times value of GV	?
BOTTOMxFGV*	Values of BOTTOM times value of GV	?
PEAKxPGV*	Values of PEAK times value of PGV	?
BOTTOMxPGV*	Values of BOTTOM times value of PGV	?

Expectation of above variables is simply the expected sign and magnitude of the variables coefficient. Estimation is just determined by the author ordinal sense after reviewing relevant literatures. The sign of the coefficient would indicate whether the variables contributes a positive or negative effect to the property price, i.e. positive sign means the variable brings a premium to the property price while negative sign means oppositely. When estimating the magnitude, it is not possible to guess what the coefficient of those variables would be. Instead, one should expect whether the coefficient of on variable would be larger, or smaller, than the other inter-related variables.

The following explain why the author has certain expectation towards some variables.

Dummy variables

LF As discussed in the Chapter 2, Chinese relate lucky floor number to good luck. They have a propensity towards the number "8". Chinese people is superstitious and they believe that owning lucky floor apartments will help them earning money as the pronunciation of "8" is similar to "wealth". Hong Kong is a place dominant by ethical Chinese. The coefficient is expected to be positive.

SV Many literatures have shown that sea view bring premium to property prices. Sea view amenities provide tenants with open view as well as luxury feeling. In Hong Kong, buildings are packed up and the supply of sea view property is limited. Therefore, sea view would have a positive effect on the property price and the coefficient is expected to be positive.

GV When a property having graveyard view, it is generally expected that this view amenity would command a penalty. Reasons behind are discussed in the previous chapter. Firstly, it is due to the uncertainty after death and the afraid of ghost (gwae). The imbalance of yin and yang in Feng Shui Theory also affect tenant's behavior. The most important reason may be its psychological effect brings to human being. Chinese people reject graveyard view property simply because they do not feel comfortable psychologically when staying in it. No one would pay much for this kind of property and even need compensation for the uncomfortable feeling. Arguably, cemetery views may not be a problem for buyers who do not believe in Feng Shui. However, the role of market expectation on the valuation of condominiums that view the cemetery cannot be totally ignored. Buyers can foresee the effect carried by the graveyard view because there is a large number of a superstitious potential buyer in the market. Therefore, they would still want a discount for such condominiums to compensate the lowed resale value. In general, the

behavior of non-superstitious buyers is also affected by their expectation of the future prospective superstitious buyers in the market. As no one in the market prefer a graveyard view amenities, including those non-superstitious buyers, the demand decreases and the price of it should also decreases. Based on the above reasons, the author expects that the coefficient of this variable would be negative.

FGV This variable, full graveyard view represents the presence of a graveyard view in both dinning room and bedroom. As discussed in earlier section, the greater exposure of graveyard view should being a heavier plenty to the property price. Thus, the coefficient of FGV is expected to be negative and has a higher absolute magnitude than that of GV.

PGV As it also belongs to the graveyard view category, its negative impact on the property price can be not neglected. However, their exposures to graveyard view are less and it should reduce the price penalty. Hence, the coefficient of PGV is still expected to be negative but the coefficient should have a lower absolute magnitude than that of a FGV and GV.

Structural variables

AGE The older the property, the lower it price should be. It is because older properties would experience greater depreciation in quality. For example, the design of the building is out fashioned and more frequent maintenance has to been done. Therefore, the coefficient of AGE would expect to be negative.

AGE^2 The author expected the rate of depreciation would become faster when the property gets older and older. For example, the repair works would be more frequent when the property gets older. Therefore, the effect of age

increases in an increasing rate and the sign of the coefficient should be positive.

FL Hong Kong is such a congested place to live in. Therefore, higher level properties would have better environment for living. For example, there is a more opened view with better air quality. The traffic noise is also greatly reduced because they locate further away from the road. Generally, people are willing to pay more for higher level properties and the coefficient of FL should be positive.

GFA GFA is commonly used as a proxy for property size. As defined by the Building Ordinance, the definition of GFA is the area contained within the external walls of the building measured at each floor level, together with the area of each balcony in the building, which shall be calculated from the overall dimensions of the balcony and the thickness of the external walls of the buildings[182]. The effect of size on property price is not as certain as floor level since the effect of it is counterbalanced by two opposite factors. Firstly, property size is used as a proxy for living space which is regarded as an economic good. More of it is preferable by one being and therefore it affects the property price positively. However, the main source of demand comes from the newly formed family. They are usually subject to financial constraints and they would prefer a smaller size amenity. If it is true, the demand of small size properties would not less than those larger size amenities or even has a higher demand. Furthermore, the demand for different size amenities also depends on the income class of people who buy the properties. The higher the income a person has, the larger the unit s/he prefers. Therefore, the sign of coefficient depends on the resident's income in that particular estate, i.e. if the housing estate is dominated by higher income group, the coefficient of the GFA variable

[182] Building Ordinance (Cap 123) in Reg. 23(3) of the Building (Planning) Regulations for approval of building plans for all building developments in Hong Kong.

would be positive and negative for lower income group.

6.5 Description of Data

The description statistics for all the variables are shown in Table 2. For the data sample of Riviera Garden, the mean of property age is approximately 2967days, which is 8 years old at the time of sale or when the Agreement for Sale and Purchase was signed. The average transaction price for those selected properties was $3684 per sq. feet of G.F.A at constant 95- price level. About one fifth of them involved the transaction of properties with a graveyard view. There is 17.8% properties have full graveyard view while 1.2% encounter a partial graveyard view. The G.F.A of the transacted properties ranged from 264 to 829 sq. ft with the average of about 660 sq. ft.. For South Horizon, properties average age is 866 days (2.4 years) old. Apart from "younger" in age, it has a higher average price of $976 per sq. feet than Riviera Garden. There is about 5% of them involved the transaction of properties with a graveyard view. Among those 5%, 3% of it has full graveyard view while the remaining is subject to partial graveyard view.

Table 5 and Table 6 in the next page show the detail descriptive statistics of selected variables in Riviera Garden and South Horizon.

Table 5. Descriptive statistics of some selected variables of Riviera Garden.

	DP	AGE	GV	FGV	PGV	SV	FL	LF	GFA
Mean	3683.577	2967.371	0.192244	0.178489	0.012430	0.245940	18.15479	0.100597	658.7514
Median	3081.962	3082.000	0.000000	0.000000	0.000000	0.000000	18.00000	0.000000	632.0000
Maximum	13351.39	5793.000	1.000000	1.000000	1.000000	1.000000	40.00000	1.000000	829.0000
Minimum	439.0020	763.0000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	264.0000
Std. Dev.	2147.961	1358.969	0.394096	0.382955	0.110802	0.430679	10.63046	0.300819	92.83671
Skewness	1.200801	0.222291	1.561961	1.679246	8.801473	1.179912	0.121019	2.655662	0.270109
Kurtosis	4.056432	2.160545	3.439722	3.819868	78.46592	2.392192	1.962222	8.052540	2.059861
Jarque-Bera	1730.688	226.8631	2502.159	3004.846	1509749.	1492.962	285.5003	13510.71	295.5895
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table 6. Descriptive statistics of some selected variables of South Horizon.

	DP	AGE	GV	FGV	PGV	SV	FL	LF	GFA
Mean	4660.593	865.5741	0.049727	0.032523	0.017203	0.497457	19.28882	0.098951	845.9761
Median	3913.168	563.0000	0.000000	0.000000	0.000000	0.000000	19.00000	0.000000	798.0000
Maximum	19349.16	4673.000	1.000000	1.000000	1.000000	1.000000	42.00000	1.000000	9117.000
Minimum	36.48000	-508.0000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	216.0000
Std. Dev.	2814.728	1235.139	0.217387	0.177391	0.130033	0.500009	10.63572	0.298606	165.5079
Skewness	1.472969	0.867335	4.142726	5.270742	7.425984	0.010172	0.091921	2.686221	10.31612
Kurtosis	4.884291	2.861118	18.16218	28.78072	56.14524	1.000103	1.977298	8.215783	454.1737
Jarque-Bera	8114.013	2009.700	198118.8	514819.3	2020737.	2654.500	716.5271	37207.81	1.35E+08
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

6.6 Models Set Up

There are six models to be estimated for each set of data. The author has chosen semi-natural logarithmic model for this research, the advantages would be discussed in next chapter.

Stage 1: Testing the Existence of Effects of graveyard view on Property Prices

Model 1: $\log (DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9GV + \varepsilon$

Model 2: $\log (DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + {}_{a9}GV + a_{10}\sum_{i=2}^{152} biTi + \varepsilon$

These two model aims at finding out does graveyard view brings significant negative effect to the property price. Two models are similar. The only difference is that the second model includes time dummies ∑ biTi, which has not been included in Model 1. By introducing the time dummy, the bias of price level between the market and the estate being studied can be minimized.

Stage 2: Examining the penalty of full graveyard view and partial graveyard view transaction with its prices derived from the market index

Model 3: $\log (DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9FGV + a_{10}PGV + a_9\sum_{i=2}^{152} biTi \quad + \varepsilon$

In this model, the author further classifies graveyard view into full and partial graveyard view. It aims at studying the amount of penalty brought by different classes of graveyard view. It also examines the impact of cultural factors on property prices.

Stage 3: Volatility of impact of graveyard view with respect to time

$$\text{Model 4: } \log(DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9FGV + a_{10}PGV + a_{11}FGV*T + a_{12}PGV*T + a_{13}\sum_{i=2}^{152} biTi + \varepsilon$$

T represents the transaction time. However, T is not a dummy variable in this model. Instead, it is equal to 1 if the transaction took place in that period. For example, the value of T is 35 if the transaction took place in the 35th month.

Stage 4: Testing the effect of graveyard view on property prices during boom and slump period

$$\text{Model 5: } \log(DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9FGV + a_{10}PGV + a_{11}\sum_{i=2}^{152} biTi + a_{12}PEAK*FGV + + a_{13}PEAK*PGV + a_{14}BOTTOM*FGV + a_{15}BOTTOM*PGV + \varepsilon$$

$$\text{Model 6: } \text{Log}(NP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9PGV + a_{10}FGV + a_{11}\sum_{i=2}^{152} biTi + a_{12}PEAK*FGV + + a_{13}PEAK*PGV + a_{14}BOTTOM*FGV + a_{15}BOTTOM*PGV + \varepsilon$$

The table in next page summarized variables included in each particular model.

Table 7. List of variables used for Riviera Garden Models and South Horizon models.

Variables	Definition	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
LOG(DP)	Logarithm of deflated transaction price	*	*	*	*	*	
LOG(NP)	Logarithm of nominal price						*
AGE	Age of property (days)	*	*	*	*	*	*
AGE^2	Square value of AGE	*	*	*	*	*	*
FL	Floor level	*	*	*	*	*	*
FL^2	Square value of FL	*	*	*	*	*	*
GFA	Gross Floor Area	*	*	*	*	*	*
GFA^2	Square value of GFA	*	*	*	*	*	*
LF	Lucky Floor	*	*	*	*	*	*
SV	Sea View	*	*	*	*	*	*
GV	Graveyard View	*	*				
FGV	Full Graveyard View			*	*	*	*
PGV	Partial Graveyard View			*	*	*	*

FGVxT	Value of FGV times Transaction Time		*		
PGVxT	Value of PGV times Transaction Time		*		
∑ **biTi**	Time dummy	*	*	*	*
PEAKxFGV	Values of PEAK times value of GV			*	*
BOTTOMxPGV	Values of BOTTOM times value of GV			*	*
PEAKxFGV	Values of PEAK times value of PGV			*	*
BOTTOMxPGV	Values of BOTTOM times value of PGV			*	*

CHAPTER SEVEN

METHODOLOGY

7.1 Introduction

In this chapter, the methodology employed in order to achieve this dissertation's objective will be analyzed.

The objective of this dissertation is to find out the impact of graveyard view and lucky floor number on properties price between a 22 years time frame. The introduction of the time frame aim at finding out the degree of impact in boom period and slump period and further examine the phenomenon by the presence of Chinese culture in Hong Kong.

7.2 Structure of the Hedonic Model

According to Chapter 2, Bulter (1982) states that only housing attributes that are costly to produce and yield utility to residents should be included in the hedonic pricing model. Therefore, the market price, P, which is determined by the hedonic price model, is,

$$P = f\, I$$

Where,

P = Market price of individual flat and

C = Set of variables that contributes to the price (P)

Concluding from Chapter 2, the most important housing variables are structural traits, locational traits and neighborhood traits. Therefore, the hedonic pricing

model becomes,

$$P = F (S, L, N)$$

As suggested by Rosen, the partial derivative of the above equation with respect to any trait as implicit marginal prices or the hedonic price as suggested by Rosen and Linneman (1980)[183], describes it as "the marginal change in the total site valuation associated with a change in that trait when all other traits level are held constant." If the relationship is linear, then,

$$P = a_0 + \sum a_i L_i + \sum b_j S_j + \sum c_k N_k + \varepsilon$$

and,

$$\Delta P / \Delta S_i = a_i$$

$$\Delta P / \Delta L_j = b_j$$

$$\Delta P / \Delta N_k = c_k$$

Where,

P	=	Market price of individual flat
S_i	=	Variables representing structural traits j
L_j	=	Variables representing locational traits k
N_k	=	Variables representing neighborhood traits q
a_0	=	Constant term
a_i, b_j, c_k	=	Regression coefficient of the corresponding variables
ε	=	Stochastic or error term

Each regression coefficient, a_i, b_j and c_k, measures the changes in property market price, P, associated with a unit change in the corresponding variable holding other factors constant. That is, other things being equal, one unit changes in S_i, L_j and N_k will make a_i, b_j and c_k units change in P respectively. Thus, the regression coefficients are actually the hedonic price of the corresponding housing traits.

[183] Linneman, P. (1980), Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics, 8, pp. 47-68.

After setting up the equation, the next step is working out these regression coefficients. Regression analysis is a technique that examines the relationship between dependent and independent variables. It is, like the interpretation of a hedonic price function, analyze the variation in property price which is attributed to different factors. The analysis can then search its best-fit line by using the Ordinary Least square (OLS) method and the regression coefficients of the function would then be calculated. The rationale of OLS is to estimate the true and unobservable function by minimizing the residual sum of squares sum, which is the sum of the difference between the actual and the forecast values of C.

7.2.1 Choice of Functional Forms

As mentioned in the previous chapter, the determination of the correct specification of the hedonic relationship requires not only the correct dependent variable but also that the correct independent variables and functional form be utilized. Now the focus would be put on the choice of functional form. Linneman (1980)[184] demonstrates in his empirical results that 86% overestimation obtained from his hedonic property valuation is due to functional form mis-specification. Therefore, apart from the choice of variables, the choice of functional form is vital as well.

The choice of functional form depends on two situations,

1. A prior knowledge of the nature of the relationship between the dependent variable and the independent variables can be logically deduced, or
2. No prior information is available

If it is the former case, then the choice of functional form is easy. The functional form would be the one which assumes the already established relationship. For instance, it is known as the functional form of the relationship between construction cost and height of the building J-shaped. Then the functional forms which assume the J-shape should be chosen.

[184] Linneman, P. (1980), Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics, 8, pp. 47-68.

For the latter case, the choice should be taken on trail and error based on empirical observation. Usually, the following mechanism is adopted. In the first attempt, linear function or logarithmic function will be assumed. If they fail, more flexible functional forms will be used. Examples include the polynomial function and Box-Cos transformation.

Linear functional form

The rationale behind of using linear function as the first attempt is that functional form of the hedonic price relationship has been hypothetical in treatment. Linear function has often been useful, following both the notion of linear coefficients as hedonic price and from their suitability in the estimation of demand elasticity of housing attributes. In this dissertation, six hedonic models would be set up. They involve several housing traits. It seems that the effect of each individual housing variable on the property price is more or less known. However, when a bundle of such variables are combined in a model, the overall effect of these variables on the relationship between them and the property price is very difficult to predict. Hence, the functional forms of the models in this dissertation would be chosen according to the second principle mentioned above. Therefore, linear function would be made as the first attempt.

Box-Cos transformation

Box-Cox transformation has been regarded as one of the most flexible functional form. Box-Cox transformation has been frequently employed in the estimation of economic models when there is no prior functional form appropriate.

It is reasonable to try several functional forms and utilize the multiple regression equation with the best performance. In this direction, Halvorsen and Pollakowski (1979)[185] recommend Box-Cox flexible functional form for hedonic

[185] Halvorsen, R. and Pollakowski H. (1979), Choice of Functional Form for Hedonic Price Equations,

analysis and measuring best performance with a goodness of fit test. The Box-Cox methodology has also been adapted in hedonic studies by Linneman (1980)[186], Megboluge (1989)[187], Mok et al (1995)[188] and Benson et al (1997)[189]. The box-Cox methodology is particularly suited for testing functional forms because many familiar forms such as semi-log, log-linear and square root subsets of the flexible Box-Cox transformation.

Recalling from previous section, the linear relationship between property price and the housing traits is,

$$P = a_0 + \sum a_i L_i + \sum b_j S_j + \sum c_k N_k + \varepsilon$$

If it is to be transformed using the Box-Cox transformation, then it becomes,

$$P^* = a_0 + \sum a_i L_i^* + \sum b_j S_j^* + \sum c_k N_k^* + \varepsilon$$

Where,

$$P^* = (P^{\lambda 1} - 1) / \lambda 1$$
$$S^* = (S^{\lambda 2} - 1) / \lambda 2$$
$$L^* = (L^{\lambda 3} - 1) / \lambda 3$$
$$N^* = (N^{\lambda 4} - 1) / \lambda 4$$

λi is the transform factor, for $\lambda i \neq 0$

and

$$P^* = \ln (P)$$
$$S^* = \ln (S)$$
$$L^* = \ln (L)$$

"Journal of Urban Economics", 10, pp. 27-49.

[186] Linneman, P (1980), Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics", 8, pp. 47-68.

[187] Megbolugbe, Issac F. (1989), A Hedonic Index Model: the Housing Market of Jos, Nigeria, "Urban Studies", 26, pp. 486-494.

[188] Mok, M. K. Henry, Chan P. K. Patrick and Chi Y. S. (1995), A Hedonic Price Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.

[189] Benson, E. D., Hansen J. L. Schwartz, Jr., and Smersh G. T. (1997), The Influence of Canadian Investment on U.S. Residential Property Values, "Journal of Real Estate Research", 13(3), pp. 231-249.

$$N^* = \ln (N)$$

for $\lambda i = 0$[190]

As λ can be assumed as any value which is greater than or equal to zero, one can see that the Box-Cox transformation is very flexible. By putting different values for λ, different functional forms can be obtained. The Box-Cox specification includes the linear (when $\lambda i = 1$ or all i), semi-log (when $\lambda i = 0$ for all i expect for $\lambda 1$ which equals 1 or vice versa), square root (when $\lambda i = 0.5$ for all i) and log-linear (when $\lambda i = 0$ for all i) as special cases. But the next question is how to calculate the power transform λ and the hedonic regression coefficients. Dissimilar with the linear form, the Box-Cox transformation employs the log likelihood to solve for the maximum transformation estimates (MLE) of the respective sets of coefficients and power transformation factors.

However, when dummy variables are included in the model, they cannot be transformed using the Box-Cox Transformation since the power transformation for these variables must necessarily be linear[191] and transformation can only be performed on variables that are strictly positive[192]. Moreover, Linneman (1980)[193] also suggests that the parameter searching process should focus mainly on the specification of the dependent variables rather than the independent variables. Hence most of the researches would assume all the λs of the independent variables equal to one and find out the value of the λ of the property price variable only.

The power transform factor of the property price variable is a parameter represents the hedonic price structure of a particular housing market, whether in the world or in a regional area within a country or even in a district within a city.

[190] The Solution for λ=0 is produced by using the Hopital's Rule. When λ approaches zero, the limit is the natural log of the corresponding variables.
[191] Linneman, P. 1980, Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics", 8, 1, pp. 47 – 68.
[192] Chau, K. W. and Ng F. F. (1998), The Effects of the Improvement in Public Transportation Capacity on Residential Price Gradient in Hong Kong, "Journal of Property Investment and Valuation, 16(4), pp. 397-410.
[193] Linneman, P (1980), Some Empirical Results on the Nature of the Hedonic Price Function for the Urban Housing Market, "Journal of Urban Economics", 8, pp. 47-68.

Megbolugbe (1989)[194] suggests that λ may be conceptually interpreted as,

> "indicator of how constrained a housing market is. A market in static (stable) equilibrium may have approximate λ value of 1 (0), while a λ value of greater than 1 may suggest a loose market, but λ less than 0 shows a tight market. The intensity of looseness or tightness may be indicated by the absolute value of λ."

Furthermore, according to Mok et al (1995)[195], the values of λs gathered by him from different researches show that λ is between 0.2 and 0.4 for cities in the U.S., while 0, +0.1 and -0.2 for Tokyo, Cali and Nigeria respectively. When λ of the model is computed out, the functional form is established.

Functional form of this research

Although Box-Cox transformation has been regarded as one of the most flexible functional form, other researches doubt the effectiveness of this method. Megbolugbe (1989)[196] argues that "since the housing hedonic equation is a price equation reflecting both supply and demand conditions, its appropriate functional form cannot generally be specified on the theoretical grounds." Mok, Chan and Cho (1996)[197] also argue that there is no significant difference between the Box-Cox specification and the linear specification while Gordon and Richardson (1982) criticize that there is no clear evidence that the linear specification is inferior to the alternative specification.

There is no one best functional form and it depends on the researcher's criteria. Although employing logarithm transformation to the dependent variable can minimize

[194] Megbolugbe, Issac F. (1989), A Hedonic Index Model: the Housing Market of Jos, Nigeria, "Urban Studies", 26, pp. 486-494.
[195] Mok, M. K. Henry, Chan P. K. Patrick and Chi Y. S. (1995), A Hedonic Price Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.
[196] Megbolugbe, Issac F. (1989), A Hedonic Index Model: the Housing Market of Jos, Nigeria, "Urban Studies, 26, pp. 486-494.
[197] Mok, H. M. K., Chan, P. P. K. & Cho, Y-S. 1995, A Hedonic Price Model for Private Properties in Hong Kong, "*Journal of Real Estate Finance and Economics"*, 10, pp. 37-48.

the potential problems of heteroscekasticity, Chau and Ng (1998)[198] show that the result from the more flexible Box-Cox specification cannot considerably improve the result from that of linear function.

Base on the above arguments, semi-natural logarithmic model was employed for all estimating equations in this research. By doing this, the coefficients can be interpret as the effects of the above factors in percentage changes in prices with respect to the changes in the dependent variables keeping other factors constant. The adoption of this functional form in housing market analysis is not uncommon because the hedonic price theory is ambiguous about the appropriate functional form[199]. The semi-natural logarithmic specification provides a reasonably close approximation to the best fitting non-linear model. Furthermore, the semi-log specification has an added advantage as it may remove the problem of heteroscedasticity[200].

7.3 Short Comings of Hedonic Pricing Model

Although Hedonic Pricing Model provides a very convenient way to analysis the data, it also has shortcomings including multicollinearity, heterogeneity and problems concerning the functional forms.

1. Multicollinearity

Multicollinearity would happen when there are two or more independent variables that are highly correlated with each other. If it exists, it will give a negative effect on the regression results. For example, t-value will be under-estimated or/and it will bring difficulties in interpreting the coefficients of independent variables.

[198] Chau, K. W. and Ng, F. F. (1998), "The Effects of Improvement in Public Transportation Capacity on Residential Price Gradient in Hong Kong, "Journal of Property Investment and Valuation, 16, 4, pp. 297-410.

[199] Mok, H. M. K., Chan, P. P. K. & Cho, Y-S. 1995, A Hedonic Price Model for Private Properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.

[200] Fletcher, M., Gallimore, P. & Mangan, J. 2000, Heteroscedasticity in Hedonic House Price Models, "Journal of Property Research", 17, 2, pp. 93-108.

When there is serious multicollinearity, symptoms include high value of R^2 together with many insignificant coefficients. If it is the case, one can try to apply a correlation matrix to reduce the seriousness of multicollinearity. Another diagnosis is to examine the change in significance level before and after the adding the suspected variable to the model. By dropping one or more correlated variables in the model, the problem of multicollinearity can be solved.

2. Heteroscedasticity

Heteroscedasticity arises because the variance of the errors terms is not the same. It is due to some data are measured more accurately than the others or the variance of the error terms is correlated with the independent variable. It may also due to the misspecification of the functional form or missing out of certain independent variables. If there is heteroscedasticity in the model, and least squares estimator is used to estimate the unknown coefficients, then, 1). The least squares estimator is still linear and unbiased estimator, but it is no longer the best linear unbiased estimator (B.L.U.E), 2). The standard errors usually computed for the least squares estimator are incorrect.[201] Confidence intervals and hypothesis tests that use these standard errors may be misleading. To remedy, one can conduct data transformation or White's correction.

In this research, all sample units are located within the same housing estate. They are similar in architectural design. Facilities provided nearby are the same. As a result, there should not be heteroscedasticity in this research.

3. Functional Forms

As discussed before, the functional form should be carefully selected as results of the regression analysis are greatly depends on the functional form. As there is no best functional form, the semi-natural logarithmic model would be employed in this study. The reasons and advantages of this functional form have been discussed in

[201] Hill, R. C., (1997), "undergraduate Econometrics", New York: Wiley.

previous section.

7.4 Hedonic Price Model

Dummy Variables

Putting dummy variables into account is one of the most important techniques of hedonic pricing model. They are used to model qualitative factors in the analysis. In other words, they are not able to quantity by numbers. Dummy Variables are widely used when dealing with discontinuous factors and can be found by measuring the differences in intercepts. Most of the literatures mentioned involve this technique to explicitly the significance of conditions under the analysis. For example, in Mok et al (1995)[202] study, he gives the binary dummy variable as a value of 1 and 0 otherwise. Lau (2000)[203] also use dummy variable to represent the lucky floor number in his study.

To begin, a particular condition must be defined, for example, good or bad, strong or weak, available or unavailable. If the condition exists, it will be coded with 1 and 0 otherwise. For example, if dwelling have favorable characteristics such as newly constructed, ease of transportation and presence of sea view, the digit of the dummy variable should be 1. Instead, if it is located near some source of pollution, the dummy variable is coded with 0.

After defining the dummy variable, the next step is constructing it into the hedonic price function. If linear relationship is assumed, the equation will be

$$P = a_0 + \sum a_j L_j + \sum b_k S_k + \sum c_q N_q + f D + \varepsilon$$

[202] Mok, H. M. K., Chan, P. P. K. & Cho, Y-S. 1995, A hedonic price model for private properties in Hong Kong, "Journal of Real Estate Finance and Economics", 10, pp. 37-48.
[203] Lau, Y. K. (2000), The Effect of Lucky Floor Numbers on Residential Properties Prices, "Unpublished BSc(Surveying) Dissertation", The University of Hong Kong.

The dummy variable is represented by "D" while the regression coefficient, f, indicated the magnitude or effect of that particular condition, if it exists, on P.

In this dissertation, dummy variables would be mostly used to investigate the extent of the effect of graveyard view and lucky floor number on property prices.

7.4.2 Test Statistics

After developing the model with correct functional form and precisely selected variables, now come to the mechanism for testing the results. There are three test statistics that would be exhibited in the four models. They are t-statistics, coefficient of determination (R^2) and F-statistics. They are indispensable for statistical approach to real estate studies. By interpreting the statistics, one can draw conclusion of significance of the empirical results. They would be introduced in the following sections.

t-statisitcs (t)

It is statistics to test the significance of the effect of each independent variable on the dependent variable P. the value of t depends on the hedonic regression coefficient of the independent variable (b) and the standard error of that coefficient (Sb),

$$t = | b / Sb |$$

the larger the value of t, the more accurate the estimate since it means that the less likely that b=0. One should note that statistical significance refers to the likelihood that the statement "P affected by the specified impendent variable" is true. "Significance" has nothing to do with the magnitude of the effect of the independent variable on P. In the other words, b can be very significant (high t-value) but the effects of the independent variable on P can be quite small (low value of b).

The relationship between dependent variable P and the independent variable is

significant at (1-α) * 100% confidence interval if

$$| t | > T (\alpha, df)$$

where α = probability of "b=0"
df = degree of freedom[204]
T (α, df) = critical value for a given α and df

For example, α is set to be 0.1. If the calculated t is higher than the critical T (0.1 df), then the hedonic regression coefficient b is said to be "significant at the 90% confidence interval" or "significant at the 10% level" and the chance that b = 0 is only 10%[205]. In this study, an independent variable will be disregarded if it is not significant at 95% confidence interval.

Coefficient of determination (R^2)

The coefficient of determination defined as the proportion of variation in the dependent variable explained by the variation in the independent variables. It reflects the goodness of fit. Its value ranges from zero to one which denotes completely lack of fit to perfectly fit. For example, if R^2 = 0.82, it means 82 % of the changes in the dependent variables P is due to the changes of the independent variables. The reason for remaining 18% variation in P is unknown or unexplained by the variables in the model. R^2 increases as more independent variables are added to the equation irrespective of whether these variables are significant. Having a look of that the coefficient determination would give some hints on how well the property price can be explained by the chosen variables in each model.

[204] Degree of freedom (df) associated with a calculated statistics is the number of available observations minus the number of constraints placed on the data by the calculation procedure. For t-statistics, df is the number of observations (N) minus the number of independent variables (k) minus one,
i.e. df = N-k-1

[205] Type one error.

F-statistics (F)

F-statistics can be used to show the significance of the R^2 statistic. R^2 follows an F distribution with k and N-k1 degree of freedom. The F-test is employed to test the null hypothesis that none of the independent variables helps to explain the variations of the dependent variable about its mean, i.e.

$$Bi = 0 \text{ for all } i$$

If the F-value is high, then its means that at least on of the independent variables is significant and able to explain the variation of the dependent variable. The method for determining whether an F-value is high or not is similar to that of t-value. You have to find out the critical F-value for the given degree of freedom and level of significance α and compare the calculated F-value with that critical F-value. If the calculated one is greater than the critical one, then the null hypothesis can be rejected. This gives an additional evidence to show the significance of the results.

CHAPTER EIGHT

EMPIRICAL RESULTS AND INTERPRETATIONS

8.1 Introduction

In this chapter, the author is going to use the software, E views, to generate regression results for those six models discussed before. Parameters in the model would be estimated by the sample data of South Horizon and Rivera Garden. After stating the result, the author would explain the reasons of the results and the usefulness of the models will also be summarized.

8.2 Stage 1: Testing the Existence of Effects of graveyard View on Property Prices

As stated in Chapter 5, the following equation will be used to find out does graveyard view carries a negative effect on the property price. The author has included factors that would expect to affect the property price significantly. As explained in Chapter 5, the logarithmic form examines the percentage changes in the dependant variable due to the included independent variables.

8.2.1 Model 1

The equation is as follow,

$$\log (DP) = a_0 + a_1 AGE + a_2 AGE^2 + a_3 FL + a_4 FL^2 + a_5 GFA + a_6 GFA^2 + a_7 LF + a_8 SV + a_9 GV + \varepsilon$$

Table 8. Extracted results of Rivera Garden of estimating equation 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.185013	0.101439	31.39844	0.0000
AGE	0.000537	6.29E-06	85.39422	0.0000
AGE^2	-9.47E-08	9.82E-10	-96.44758	0.0000
FL	0.002532	0.000681	3.718762	0.0002
FL^2	-4.94E-05	1.74E-05	-2.834099	0.0046
GFA	-0.001057	0.000304	-3.475877	0.0005
GFA^2	8.93E-07	2.25E-07	3.959434	0.0001
LF	0.007343	0.006379	1.151198	0.2497
SV	0.034815	0.004887	7.123870	0.0000
GV	-0.025388	0.005014	-5.063531	0.0000
R-squared	0.647406			
F-statistic	1228.980			
Durbin-Watson stat	0.170911			

Table 9. Extracted results of South Horizon from estimating equation 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.539267	0.010672	331.6450	0.0000
AGE	0.000265	2.71E-06	98.03804	0.0000
AGE^2	-9.58E-08	8.72E-10	-109.8502	0.0000
FL	0.002366	0.000519	4.554647	0.0000
FL^2	-4.11E-05	1.27E-05	-3.227221	0.0013
GFA	-1.39E-05	1.28E-05	-1.083132	0.2788
GFA^2	3.65E-09	2.75E-09	1.327525	0.1844
LF	0.001854	0.004687	0.395545	0.6924
SV	0.076331	0.002936	25.99921	0.0000
GV	-0.098549	0.006695	-14.71997	0.0000
R-squared	0.452461			
F-statistic	1461.178			
Durbin-Watson stat	0.439904			

From the table, one can observe that the sign of the coefficient GV is negative as expected with significant at less than 0.5% level. However, the results are not quite satisfactory. Coefficients of some variables such as AGE and GFA are not as expected. Results of some variables are not significant at 0.5% level. Furthermore, the result of R^2 is just of 65% and 45%, meaning that the variation in the dependent variable, DP, is not quite able to be explained by the variation in the independent variables.

There are two reasons for explaining the low R^2. It may due to missing out of

some independent variables that would also bring a significant impact on the property price. The other reason may be the due to the existence of errors in the dependent variable. The value of the deflated property prices are based on price deflator. There would be error if the deflators are incorrect. In this equation, the dependent variable, DP, is deflated by price index from the Rating and Valuation Department. As discussed before, it is calculated from about 50 popular housing estates in Hong Kong but not specifically from Rivera Garden or South Horizon only. Hence, the price index is representing all those popular estates but not any individual housing estate. As those price deflators are generated from different housing estates of different characteristics, it cannot reflected any price appreciation or depreciation of individual housing estate. Say, in some period, the price of the property would fluctuate more volatile than other estates. In these circumstances, the price deflators are not able to reflect the reality and bias would arise.

8.2.2 Model 2

The following regression model aims at estimate the penalty of graveyard view transaction with its prices derived from the market index.

$$\mathbf{Log\ (DP) = a_0 + a_1 AGE + a_2 AGE^2 + a_3 FL + a_4 FL^2 + a_5 GFA + a_6 GFA^2 + a_7 LF + a_8 SV + a_9 GV + a_{10} \sum_{i=2}^{152} biTi + \varepsilon}$$

In this estimating equation, time dummy is introduced. The time dummy aims at capturing the differences in price fluctuation between the estate and the market. If the probability of T in the T-statistic is significant at 5% level, it illustrates the deflator of that particular period is not able to deflate the transaction price ideally. It helps explaining those unacceptable results generated from the estimating equation 1.

Table 10. Extracted results of Riviera Garden in estimating equation 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.142212	0.035104	89.51163	0.0000
AGE	0.000442	2.42E-05	18.28674	0.0000
AGE^2	-4.25E-08	5.26E-09	-8.074224	0.0000
FL	0.002890	0.000206	14.04887	0.0000
FL^2	-4.97E-05	5.27E-06	-9.440896	0.0000
GFA	-0.000917	9.16E-05	-10.01211	0.0000
GFA^2	7.84E-07	6.79E-08	11.54043	0.0000
LF	0.001362	0.001918	0.709741	0.4779
SV	0.037494	0.001476	25.41068	0.0000
GV	-0.028295	0.001515	-18.67627	0.0000
T11	0.007842	0.012048	0.650875	0.5152
T20	-0.019141	0.011731	-1.631646	0.1028
T25	-0.004496	0.011924	-0.377004	0.7062
T33	0.024433	0.014229	1.717079	0.0860
T34	0.021857	0.014925	1.464495	0.1431
T35	0.010290	0.015185	0.677684	0.4980
T63	-0.025095	0.016268	-1.542632	0.1230
T64	0.009801	0.016562	0.591811	0.5540
T65	0.007182	0.016827	0.426801	0.6695
T68	-0.001334	0.017699	-0.075396	0.9399
T69	0.000681	0.017761	0.038356	0.9694
T70	0.033810	0.017872	1.891808	0.0586
R-squared	0.969570			
F-statistic	1169.562			
Durbin-Watson stat	1.970114			

Table 11. Extracted results of South Horizon in estimating equation 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.147888	0.009699	324.5549	0.0000
AGE	2.25E-05	1.75E-06	12.91485	0.0000
AGE^2	-2.06E-09	5.07E-10	-4.059830	0.0000
FL	0.002008	0.000144	13.91009	0.0000
FL^2	-2.78E-05	3.54E-06	-7.857322	0.0000
GFA	0.000178	3.73E-06	47.78385	0.0000
GFA^2	-1.90E-08	7.70E-10	-24.64987	0.0000
LF	0.002795	0.001299	2.152306	0.0314
SV	0.010205	0.000954	10.69396	0.0000
GV	-0.055344	0.002031	-27.24798	0.0000
T2	0.010591	0.012040	0.879627	0.3791
T109	0.002445	0.013107	0.186543	0.8520
T114	0.007483	0.011996	0.623817	0.5328

T116	0.020760	0.012118	1.713202	0.0867
T117	-0.024412	0.012833	-1.902242	0.0572
T146	0.010450	0.013052	0.800634	0.4234
T150	-0.004147	0.013835	-0.299790	0.7643
T152	0.023399	0.015607	1.499267	0.1338
R-squared	0.958861			
F-statistic	2296.240			
Durbin-Watson stat	1.798715			

Table 12. Time dummies that are significant at 5% level in the t-statistics

	Rivera Garden	**South Horizon**
Time Dummy	T11	T2
	T20	T109
	T25	T114
	T33	T116
	T34	T117
	T35	T146
	T63*	T150
	T64*	T152
	T65*	
	T68*	
	T69*	
	T70*	

*Periods that within year 1997.

From the tables above, one can see that the seriousness of bias of price deflators. For both estates, transaction prices of some periods cannot be fully deflated by the Rating and Valuation Department's monthly price index. For Riviera Garden, those periods concentrate on the middle part of the time frame while for South Horizon, they stress at the end of the time frame. It may due to many factors. An example is the improvements of the transportation system. According to the Highways Department, there was great improvement in the transportation network in the South of New Territories in the past few years. The construction of Tsing Ma Bridge and the third Tsing Yi Bridge in 1997 has substantially improved the transportation network in Hong Kong. The accessibility of Riviera Garden is much better than before. Therefore, as indicated in Appendix 3, the price movement of Riviera Garden in 1997 is greater than other popular estates. The differences in pace of development in different districts are one of the reasons contributing to these results. However, the author is not going to

investigate this matter in depth as it is not the main research area of this dissertation.

Let's examine the sign of coefficients of the time dummy that are insignificant at 5% level. For the case of Rivera Garden, two third of those 152 months giving positive coefficients, showing that the price level of Rivera Garden is higher than those popular estates selected by the Rating and Valuation Department. In contrast, the price level of South Horizon is always higher than the market, time dummy with positive coefficient contributing 62.5% of those 152 months. Again, it is due to the differences in characteristics between those two estates. South Horizon is located in New Territories while South Horizon is located in Hong Kong Island. Hong Kong Island is dominant by higher income tenants as the Hong Kong Island contributes a higher land price than New Territories. The style and standard of living is totally different in those two areas. In the author points of view, differences in location and living quality between two areas would be the major reasons for the results. However, it is just a subjective judgment by the author. Further study is required to support this argument.

One can observed that after introducing the time dummy, the R^2 has been improved greatly. R^2 of both models are over 95%. The explanatory power of this model is very good. It confirms the author's presumption that the price index extracted from Rating and Valuation Departments cannot fully deflated the property's transaction prices of both chosen estates. It also evidenced that in this estimating equation, the real prices of those selected properties are due to those variables chosen by the author and it confirms there is no missing out of other important variables.

After confirming the equation includes right variables, the next step is to look at the results of other independent variables in details.

Table 13. Extracted results of Riviera Garden in estimating equation 2

Variable	Coefficient	Prob.
C	3.142212	0.0000
AGE	0.000442	0.0000

AGE^2	-4.25E-08	0.0000
FL	0.002890	0.0000
FL^2	-4.97E-05	0.0000
GFA	-0.000917	0.0000
GFA^2	7.84E-07	0.0000
LF	0.001362	0.4779
SV	0.037494	0.0000
GV	-0.028295	0.0000

Table 14. Extracted results of South Horizon in estimating equation 2

Variable	Coefficient	Prob.
C	3.147888	0.0000
AGE	2.25E-05	0.0000
AGE^2	-2.06E-09	0.0000
FL	0.002008	0.0000
FL^2	-2.78E-05	0.0000
GFA	0.000178	0.0000
GFA^2	-1.90E-08	0.0000
LF	0.002795	0.0314
SV	0.010205	0.0000
GV	-0.055344	0.0000

In both estates, the coefficient of GV is negative and is significant at 5% level. It proved that graveyard view does carry significant negative effect to the property prices. For Riviera Garden and South Horizon, graveyard view carries about 2.5% and 10% of penalty to property prices respectively. It shows that Hong Kong people require compensation when purchasing a graveyard view amenity. For other variables, apart from AGE, GFA and LF, the sign of those coefficients are also as expected and significant at 5% level. The positive coefficients of the FL and SV shows that people are willing to pay extra for higher floor level and sea view amenities. Variables of square terms of FL for both estates are negative implying that the effect of floor level is increasing at a decreasing rate. People are less preferred to live in an amenity that is located too high.

Apart from the above expected results, the author discovers some interesting results from some variables. They are the sign of coefficient of variables such as AGE, GFA and LF.

The coefficient of variable AGE is positive instead of negative as expected. It shows that the age of the property does not carry penalty to the property price. Instead, it brings premium as the building gets older. This phenomenon is explainable by taking time dummy Ti into consideration. In both estates, the transportation network is greatly improved after the construction of Tsing Yi Bridge (North) and the extension work of Ap Lei Chau Bridge. Tsing Yi Bridge (North) connects Rivera Garden to Tsing Yi while the Ap Lei Chau Bridge connects South Horizon to Aberdeen and other parts of Hong Kong Island. As time goes by, the transportation network of both selected estates become more mature, they are more bus routes and mini bus routes serving the tenants. Such improvement of transportation network would definitely bring advantage to the property prices of Riviera Garden and South Horizon. For the coefficient of AGE^2, it is negative for both cases. It means that the effect of AGE is increasing at a decreasing rate. It is because the benefits from the transportation network will be generally taken off by the rate of depreciation of the buildings.

There was a contrasting result on the sign of GFA and GFA^2 for both estates. For Riviera Garden, the coefficient of GFA is negative while it is positive for GFA^2 coefficient. Results of GFA and GFA^2 of South Horizon are totally opposite to Riviera Garden. It means that for Riviera Garden, the demand for smaller sized flats is higher than those larger sized flats, vice versa for South Horizon. As just mentioned, tenants in South Horizon receive a higher income when comparing to those in Riviera Garden. They would prefer higher sized flats for better quality of living. It explains why there is a contradictive result of GFA's coefficient. The sign of the square terms suggest that for Rivera Garden, the effect of GFA is decreasing in an increasing rate, vice versa for South Horizon. This result shows that Hong Kong people still prefer purchasing an optimal size flat, not too large or too small, according to their own preference and financial status.

Coefficient of LF for both estates is positive. However, results generated from Riviera Garden are not significant at 5% level. It means purchasers of South Horizon willing to pay premium for lucky floor. On the contrary, there is not enough evidence to shows that purchasers of Rivera Garden would pay extra for lucky floor level.

One can see that people with higher income people prefer larger flats and they would also purchase luxury goods like lucky floor. However, lower income group still want to get rid of graveyard, prefer sea view and high floor amenities like those high income group. Lucky floor is relatively unimportant to them. It suggests that people still have great concerns on the view and the floor level when they are subject to financial constraints.

8.3 Stage 2: Estimating the Penalty of Full and Partial Graveyard View on Amenities Transaction Prices

After confirming graveyard view brings penalty to property price, let's move a step forward. The author would like to know how bad graveyard view is in Hong Kong people's mind. It will be done by splitting up the graveyard view into two classes, full graveyard view and partial graveyard view.

8.3.1 Model 3

The estimating equation used in Model 3 is listed below,

$$\log(DP) = a_0 + a_1 AGE + a_2 AGE^2 + a_3 FL + a_4 FL^2 + a_5 GFA + a_6 GFA^2 + a_7 LF + a_8 SV + a_9 FGV + a_{10} PGV + a_9 \sum_{i=2}^{152} b_i Ti + \varepsilon$$

This estimating equation is very similar to the previous one. The only difference is that the variable GV is further divided into FGV and PGV. The purpose of it is to examine the degree of impact of full graveyard view and partial graveyard view on property prices.

Table 15. Extracted results of Riviera Garden in estimating equation 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.030079	0.001550	-19.40591	0.0000
PGV	-0.008938	0.005217	-1.713139	0.0867

Table 16. Extracted results of South Horizon in estimating equation 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.061697	0.002395	-25.75664	0.0000
PGV	-0.043471	0.003126	-13.90628	0.0000

Coefficient of FGV and PGV is negative for both estates, meaning that no matter how much the amenities expose to graveyard view, there would be a penalty. However, the result of PGV in Riviera Garden is not quite significant. It is because when the author carrying out site visit in Riviera Garden, the author has already found that it is quite difficult to decide how much graveyard view does the property subject to. It is due to differences in orientation of the flats in different towers, the blockage of view by tall tress and the Tsing Yi Bridge at the front of some building blocks. Lastly, the differences in distance between the graveyard and different towers have not been taken into account. For South Horizon, all the above problems are not significant, the author can easily judge whether it is a full graveyard view amenities or partial graveyard view amenities by carrying out site visit and studying the layout plan.

As a result, the insignificant may due to author's misjudgment when determining the quality of graveyard view in Riviera Garden. Therefore, in this equation, one should rely on the results generated from South Horizon.

8.4 Stage 3: Volatility of Impact of Graveyard View with Respect to Time

8.4.1 Model 4

The estimating equation used in Model 4 is listed below,

$$\log (DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9FGV + a_{10}PGV + a_{11}FGV*T + a_{12}PGV*T + a_{13}\sum_{i=2}^{152} biTi + \varepsilon$$

In this estimating equation, a new independent variable, GVxT is introduced. The purpose of introducing GVxT into the equation is to examine the volatility of the graveyard view attribute. It purpose is to find out is there any time trend for the GV attribute.

Table 17. Extracted results of Riviera Garden in estimating equation 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.027571	0.002820	-9.778702	0.0000
PGV	-0.007634	0.008168	-0.934648	0.3500
FGVXT	-4.11E-05	3.82E-05	-1.073564	0.2831
PGVXT	-3.23E-05	0.000122	-0.263596	0.7921

Table 18. Extracted results of South Horizon in estimating equation 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.056793	0.004002	-14.19126	0.0000
PGV	-0.033252	0.005419	-6.136043	0.0000
FGVXT	-8.77E-05	5.74E-05	-1.527576	0.1266
PGVXT	-0.000179	7.75E-05	-2.310345	0.0209

From the extracted results shown in the above tables, one can observe that the results of FGV and PGV state the same as model 3. Results of FGV and FGVxT of both

estates are similar. The coefficient of FGV is negative and is not significant at 5% level. However, although the coefficient of FGV is still negative, it is significant at 5% level, meaning that it has not enough evidence to show the penalty of full graveyard view is stable according to time. Concerning the results of PGV and PGVxT, for Riviera Garden, result of PGV is not significant at 5% level and therefore, the result of PGVxT should be discarded. The result of PGV in South Horizon is significant at 5% level, and the coefficient of variable PGVxT is negative and the result is significant at 5% level as well. It means that the penalty of partial graveyard view would fluctuate according to time. The different performance between variables FGVxT and PGVxT shows that a fixed penalty is inserted to properties that expose to a large degree of graveyard view in long run. It confirms potential purchasers are very concern about the graveyard view attribute when they are choosing their property.

However, one problem of this equation is that GVxT represent a general effect of graveyard view on property price. In other words, the effect of some periods may be taken up by other periods within the time frame. The effect might be cancelled out by each others. This model can only shows that there is no time trend for the graveyard yard over time. The author still wonders that the effect during a particular period would exert an extra penalty when comparing to other periods. In the next stage, boom period and slump period would be test separately to have a more details analysis.

8.5 Stage 4: Testing the Effect of Graveyard View on Property Prices during Boom and Slump Period

In this stage, the author would like to find out the seriousness of penalty brought by graveyard view, during boom period and slump period. In other words, the intension for potential homebuyer to reject a graveyard views amenities when they are selecting their home during boom and slump period.

8.5.1 Model 5

The estimating equation used in Model 4 is listed below,

$$\log(DP) = a_0 + a_1AGE + a_2AGE^2 + a_3FL + a_4FL^2 + a_5GFA + a_6GFA^2 + a_7LF + a_8SV + a_9FGV + a_{10}PGV + a_{11}\sum_{i=2}^{152} biTi + a_{12}PEAK*FGV + a_{13}PEAK*PGV + a_{14}BOTTOM*FGV + a_{15}BOTTOM*PGV + \varepsilon$$

Table 19. Extracted results of Riviera Garden in estimating equation 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.027148	0.001854	-14.64655	0.0000
PGV	-0.003976	0.006257	-0.635504	0.5251
PEAKXFGV	-0.010607	0.003486	-3.042874	0.0024
PEAKXPGV	-0.019702	0.012037	-1.636864	0.1017
BOTTOMXFGV	-0.002853	0.006784	-0.420582	0.6741
BOTTOMXPGV	0.003977	0.023515	0.169118	0.8657
R-squared	0.969784			

Table 20. Extracted results of South Horizon in estimating equation 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.056437	0.002752	-20.50466	0.0000
PGV	-0.038508	0.003649	-10.55387	0.0000
PEAKXFGV	-0.024048	0.005471	-4.395932	0.0000
PEAKXPGV	-0.020624	0.007096	-2.906252	0.0037
BOTTOMXFGV	-0.003581	0.009043	-0.395986	0.6921
BOTTOMXPGV	-0.002603	0.013852	-0.187903	0.8510
R-squared	0.958996			

As shown in the above tables, all variables related to graveyard view are negative. The effect of partial graveyard view of Riveria Garden is not significant and the results of PEAKxPGV and BOTTOMxPGV should be discarded. In the case of Riviera Garden, only FGV and PEAKxFGV are significant at 5% level. It shows that the penalty brought by graveyard view is more severe during boom period. During

slump period, it is not enough evidence to show graveyard view brings larger penalty to property price, comparing to other periods. It implies that when the economy is good, people tend to reject graveyard view amenities more, they would ask for a higher compensation when buying a graveyard view amenities. When the economy is bad, people have a tighter budget. They have a higher tolerance to purchase a graveyard view amenities. This result matches with those in model 2 that higher income group tends to reject graveyard view more than those lower income group. Combing the results of model 2 and model 5, one can conclude that if the purchasers subject to good financial status, they tend to reject graveyard view amenities or require extra compensation when purchasing it, leads to a lower price of graveyard view amenities during boom period and/ or in areas that are dominant by high income tenants.

Results generated from South Horizon data set matches with the above conclusion. There is just one point to add. As the variable PGV is significant in South Horizon, the result of variables PEAKxPGV and BOTTOMxPGV are valid and should be considered. Similar to the results of PEAKxFGV and BOTTOMxFGV, both the coefficient of variables PEAKxPGV and BOTTOMxPGV are negative. Alternately, the result of PEAKxPGV is significant at 5% level while BOTTOMxFGV is not. It means that the partial graveyard view amenities also subject to price penalty. The degree of graveyard view that an amenity exposed to is not a matter, both partial and full graveyard view would bring negative effect to property price during boom and slump period.

8.5.2 Model 6

The estimating equation used in Model 4 is listed below,

$$\log(NP) = a_0 + a_1 AGE + a_2 AGE^2 + a_3 FL + a_4 FL^2 + a_5 GFA + a_6 GFA^2 + a_7 LF + a_8 SV + a_9 PGV + a_{10} FGV + a_{11} \sum_{i=2}^{152} biTi + a_{12} PEAK*FGV + + a_{13} PEAK*PGV + a_{14} BOTTOM*FGV + a_{15} BOTTOM*PGV + \varepsilon$$

In this model, the dependent variable, log (DP) is replaced by log (NP). As a result, the author does not use deflators to capture the price difference between the market and the estate, but by time dummy solely.

The author expects there would not be too much change in the results because two models are very similar in nature.

Table 21. Extracted results of Riviera Garden in estimating equation 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.027409	0.001849	-14.82577	0.0000
PGV	-0.003914	0.006241	-0.627237	0.5305
PEAKXFGV	-0.010501	0.003477	-3.020451	0.0025
PEAKXPGV	-0.019859	0.012005	-1.654249	0.0981
BOTTOMXFGV	-0.002574	0.006766	-0.380505	0.7036
BOTTOMXPGV	0.003862	0.023453	0.164653	0.8692
R-squared	0.901229			

Table 22. Extracted results of South Horizon in estimating equation 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FGV	-0.055617	0.002706	-20.55399	0.0000
PGV	-0.037416	0.003587	-10.43110	0.0000
PEAKXFGV	-0.024930	0.005378	-4.635438	0.0000
PEAKXPGV	-0.021857	0.006976	-3.132955	0.0017
BOTTOMXFGV	-0.004458	0.008890	-0.501447	0.6161
BOTTOMXPGV	-0.003781	0.013618	-0.277624	0.7813
R-squared	0.872116			

As expected, apart from the time dummy Ti, all coefficients of other variables are of the same size for both equations. Their levels of significant are similar as well. Both R^2 are high but model 5 generates higher value of R^2, meaning that the explanatory power of model 5 is better than model 6. It implies that using deflators together with time dummies gives a better goodness of fit to the results.

CHAPTER NINE

CONCLUSION

9.1 Summary of Findings

Residential properties are an important investment in Hong Kong people's life. After having literature review on hedonic model, one can conclude that property prices subject to different characteristics such as structural, neighborhood and locational traits. However, there is limited research on the area of graveyard view amenities.

Hong Kong is dominant by ethical Chinese. Using Hong Kong as a base for this research can truly reflect cultural effect on property price. The result of graveyard view in Penang case shows a significantly negative impact to the property price. Results of this research show that effect of graveyard view is not just severe in Hong Kong or China. The effect would appear in everywhere once there are a certain proportion of Chinese people.

In the study of Penang, the researcher has already shown that the penalty brought by graveyard view has dropped after the Asian Financial Crisis. The author would like to find out how heavy penalty graveyard view carries to Hong Kong properties, especially during boom period and slump period.

In this study, the author has chosen two estates to examine the effect of graveyard view on property price in Hong Kong. With the help of E views, the results of Ordinary Least Square estimation shows that graveyard view properties does bring penalty to the property prices. The amount of penalty is greater during boom period or if the properties are in a region that is dominated by wealthy people. Both implies that people tends to reject graveyard view properties if they are financially sound. Furthermore, the author has proven that the degree of graveyard view that the amenity

subjected to does not affect the performance of the property price during boom or slump period. Contrarily, full graveyard view does insert a greater amount of penalty on property price than partial graveyard view. Results are matches with those the study based on Penang.

To conclude, graveyard view amenities bring significant penalty to property prices in area with dominant Chinese. The author explained this result on the ground of psychological effect rather than purely Feng Shui matter. In other words, for those living in a graveyard view amenities, their health is not directly affect by bad Feng Shui of graveyard view but due to the cultural belief in Chinese societies. Uncertainties after death affect people's behavior thus create psychological effect on Chinese people's health. The high pressure life style of Hong Kong people has magnified the psychological effect seriously.

Hong Kong appraisers are usually under-estimated the effect of graveyard view on property price. As graveyard view shows a significant negative impact to property prices, it is necessary for appraisers reconsidering the seriousness of burden carried by graveyard view. Town planners, in order to maximize land value, should take extra care when zoning residential land use near graveyards. Developers have to minimize the amount of graveyard view amenities in the estate when deciding the layout of it. In an area with dominant Chinese, purchasers have to take in the account for the penalty brought by graveyard view. It is because future potential buyers are ethical Chinese who have strong belief on Feng Shui. The resale ability of a graveyard view amenity would be lower than other types of view, keeping other factors constant.

9.2 Limitation of this Study

The major limitation in this study is the misjudgment when defining a property subject to partial graveyard view in the case of Riviera Garden. As a result, the result of the variable PGV is not significant in those models of Riviera Garden. One of the major reasons behind may be due to the ignorance of distance effect. In this study, the author did not consider the improvement of the transportation network. The coefficient of AGE is positive for both estates. Therefore, dummy variable is suggested to take up the change in the transportation network, which may also be significant to the property prices.

Secondly, some of the results of Riviera Garden and South Horizon conflicts each other. Although the author has explained the reasons behind, it is better to include more estates in stead of two to confirm the effect of different variables on property prices.

9.3 Area for Further Studies

The impact of cultural belief on property prices is a valuable area for further study. Apart from graveyard view, is there other cultural factors would affect purchaser preference when choosing their property? Furthermore, in the study, the author proved that graveyard view amenities brought penalty to the property price in Hong Kong, which is dominant by ethical Chinese. Although the author has differentiated the differences between Chinese and Western culture, one have not proved that the effect of graveyard view on property prices in other foreign countries. Therefore, it is an interesting topic for researchers to find out is there other cultural factors that would have significant impact on property prices, in Chinese society or other societies with different cultural backgrounds.

This study is based on an assumption. The author has assumed that Hong

Kong has reached the critical mass of ethical Chinese, which are the superstitious traders. However, there is no research to study it. The size of critical mass has not been found out. Further studies are required to find out how large is the critical mass is needed to present the effect of graveyard view. Apart from graveyard view, it also applies to other cultural factors that would affect properties prices, if there is any. Furthermore, would the size of critical mass changes according different cultural factors? It is also worth studying.

In this study, the author has concentrated on the burden carried by graveyard view on property prices. It leaves a room for future researchers to conduct find out if this effect also hold true for other types of properties such as offices and shopping centre.

APPENDIX

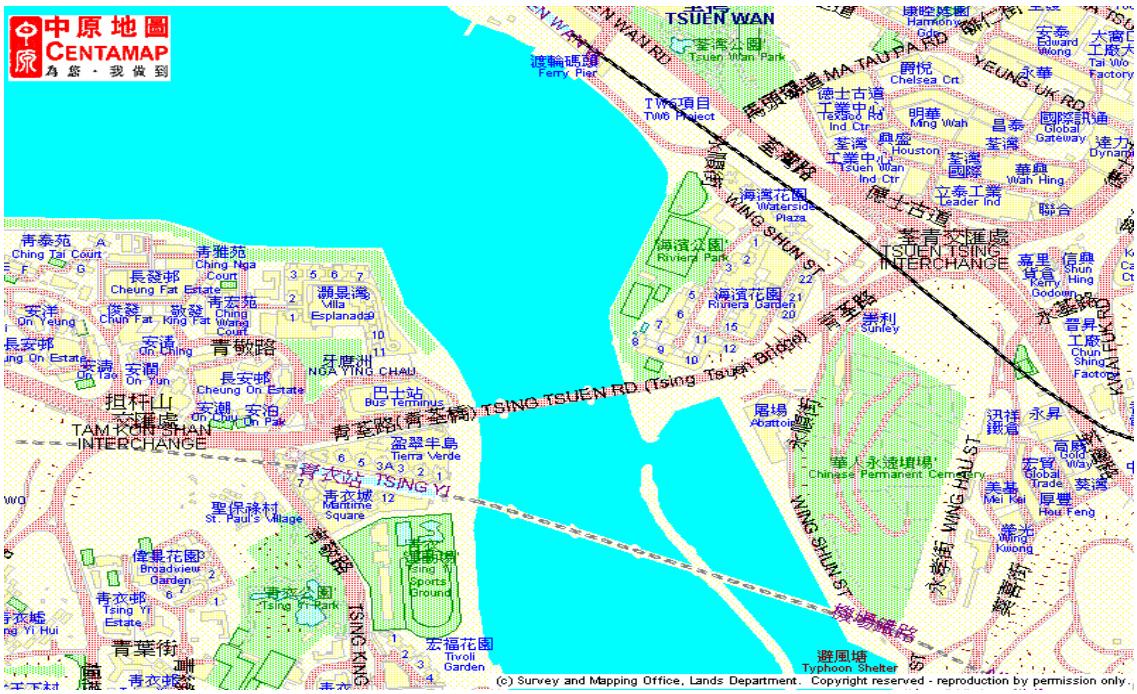
Appendix 1

Special Terms in Chinese

Feng Shui	風水
Gwae	鬼
Yin	陰
Yang	陽
Li	理
Chi	氣
Sha	煞
Ling Po	靈波

Appendix 2

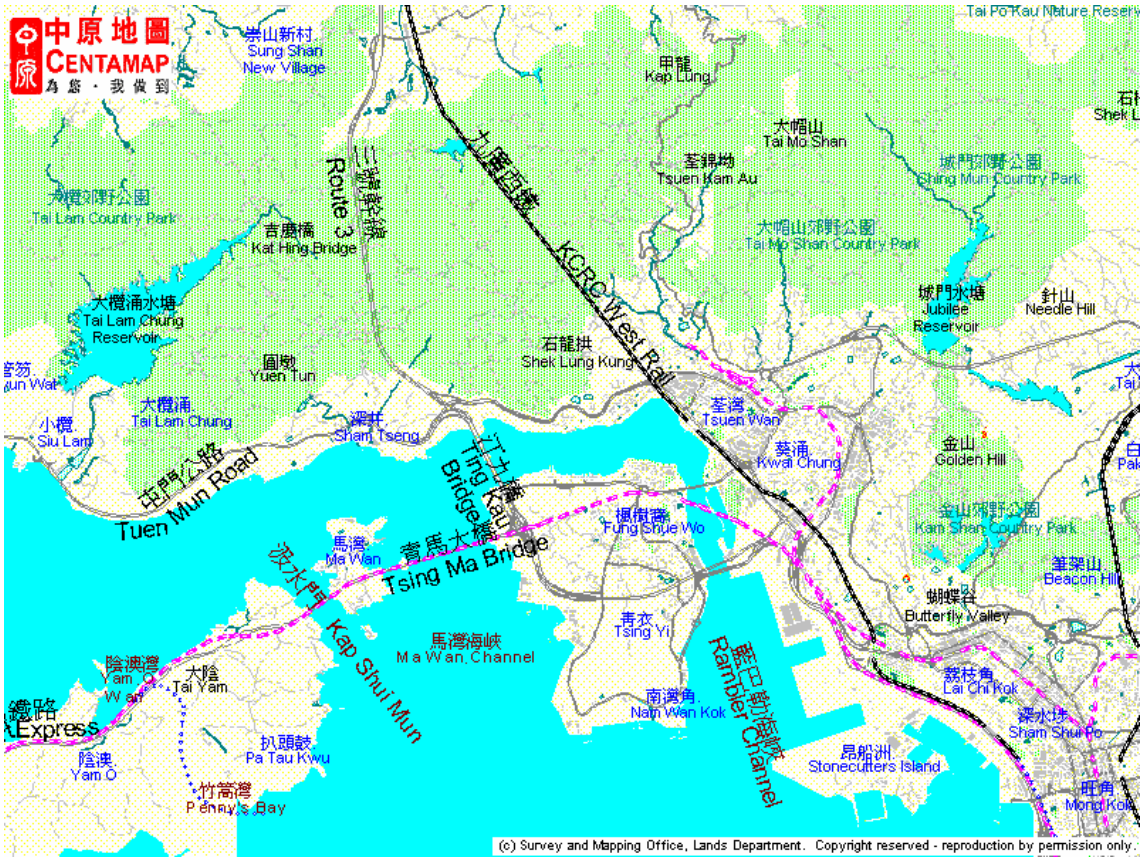
Plan of Rivera Garden and the location of Chinese Permanent Cemetery and Tsing Tsuen Bridge[206]



[206] "Centamap", www.centamap.com

Appendix 3

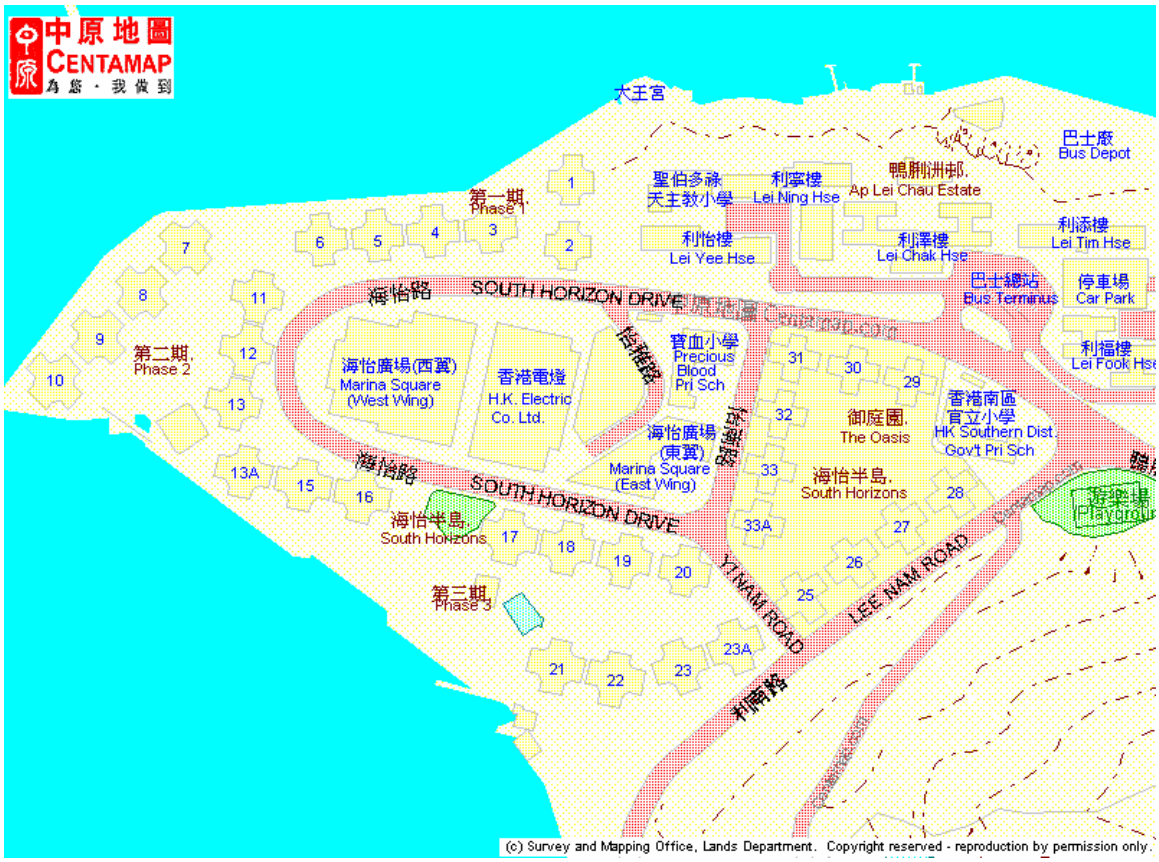
Transportation network of Riviera Garden[207]



[207] "Centamap", www.centamap.com

Appendix 4

Plan of South Horizon[208]



[208] "Centamap", www.centamap.com

Appendix 5

Location of Chinese Permanent Cemetery and the Ap Lei Chau Bridge[209]

[209] "Centamap", www.centamap.com

Appendix 6

Locations of bus stops in South Horizon[210]

[210] 2005 Hong Kong Map (2005), 便利出版社.

Appendix 7

Results of Riviera Garden in estimating equation 1

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.185013	0.101439	31.39844	0.0000
AGE	0.000537	6.29E-06	85.39422	0.0000
AGE^2	-9.47E-08	9.82E-10	-96.44758	0.0000
FL	0.002532	0.000681	3.718762	0.0002
FL^2	-4.94E-05	1.74E-05	-2.834099	0.0046
GFA	-0.001057	0.000304	-3.475877	0.0005
GFA^2	8.93E-07	2.25E-07	3.959434	0.0001
LF	0.007343	0.006379	1.151198	0.2497
SV	0.034815	0.004887	7.123870	0.0000
GV	-0.025388	0.005014	-5.063531	0.0000

R-squared	0.647406	Mean dependent var	3.496385
Adjusted R-squared	0.646879	S.D. dependent var	0.249866
S.E. of regression	0.148480	Akaike info criterion	-0.975075
Sum squared resid	132.8073	Schwarz criterion	-0.963962
Log likelihood	2951.800	F-statistic	1228.980
Durbin-Watson stat	0.170911	Prob(F-statistic)	0.000000

Appendix 8

Results of South Horizon in estimating equation 1

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 15924

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.539267	0.010672	331.6450	0.0000
AGE	0.000265	2.71E-06	98.03804	0.0000
AGE^2	-9.58E-08	8.72E-10	-109.8502	0.0000
FL	0.002366	0.000519	4.554647	0.0000
FL^2	-4.11E-05	1.27E-05	-3.227221	0.0013
GFA	-1.39E-05	1.28E-05	-1.083132	0.2788
GFA^2	3.65E-09	2.75E-09	1.327525	0.1844
LF	0.001854	0.004687	0.395545	0.6924
SV	0.076331	0.002936	25.99921	0.0000
GV	-0.098549	0.006695	-14.71997	0.0000

R-squared	0.452461	Mean dependent var	3.600921
Adjusted R-squared	0.452151	S.D. dependent var	0.238157
S.E. of regression	0.176276	Akaike info criterion	-0.632903
Sum squared resid	494.4998	Schwarz criterion	-0.628083
Log likelihood	5049.174	F-statistic	1461.178
Durbin-Watson stat	0.439904	Prob(F-statistic)	0.000000

Appendix 9

Results of Riviera Garden in estimating equation 2

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.142212	0.035104	89.51163	0.0000
AGE	0.000442	2.42E-05	18.28674	0.0000
AGE^2	-4.25E-08	5.26E-09	-8.074224	0.0000
FL	0.002890	0.000206	14.04887	0.0000
FL^2	-4.97E-05	5.27E-06	-9.440896	0.0000
GFA	-0.000917	9.16E-05	-10.01211	0.0000
GFA^2	7.84E-07	6.79E-08	11.54043	0.0000
LF	0.001362	0.001918	0.709741	0.4779
SV	0.037494	0.001476	25.41068	0.0000
GV	-0.028295	0.001515	-18.67627	0.0000
T2	0.015910	0.007606	2.091744	0.0365
T3	0.046211	0.006404	7.215494	0.0000
T4	0.069784	0.007368	9.470697	0.0000
T5	0.082954	0.007603	10.91010	0.0000
T6	0.088954	0.007507	11.84998	0.0000
T7	0.085693	0.007646	11.20690	0.0000
T8	0.064849	0.008880	7.302478	0.0000
T9	0.068589	0.013076	5.245235	0.0000
T10	0.034546	0.010580	3.265393	0.0011
T11	0.007842	0.012048	0.650875	0.5152
T12	-0.025441	0.012445	-2.044318	0.0410
T13	-0.047496	0.011671	-4.069572	0.0000
T14	-0.048938	0.012025	-4.069621	0.0000
T15	-0.053177	0.009179	-5.793228	0.0000
T16	-0.049370	0.009323	-5.295541	0.0000
T17	-0.041088	0.009502	-4.324099	0.0000
T18	-0.065985	0.010333	-6.385934	0.0000
T19	-0.038508	0.010623	-3.624861	0.0003
T20	-0.019141	0.011731	-1.631646	0.1028
T21	-0.040698	0.013002	-3.130174	0.0018
T22	-0.066915	0.014009	-4.776483	0.0000
T23	-0.059624	0.013107	-4.548899	0.0000
T24	-0.038410	0.012673	-3.030946	0.0024
T25	-0.004496	0.011924	-0.377004	0.7062
T26	0.047501	0.012918	3.677184	0.0002
T27	0.121135	0.012418	9.755091	0.0000
T28	0.156505	0.012758	12.26687	0.0000
T29	0.109080	0.016099	6.775766	0.0000
T30	0.104727	0.014234	7.357441	0.0000
T31	0.066906	0.015024	4.453288	0.0000
T32	0.046001	0.013966	3.293680	0.0010

T33	0.024433	0.014229	1.717079	0.0860
T34	0.021857	0.014925	1.464495	0.1431
T35	0.010290	0.015185	0.677684	0.4980
T36	-0.030944	0.015651	-1.977088	0.0481
T37	-0.095995	0.016445	-5.837346	0.0000
T38	-0.116215	0.016167	-7.188578	0.0000
T39	-0.080713	0.014709	-5.487221	0.0000
T40	-0.083145	0.015122	-5.498120	0.0000
T41	-0.094039	0.015930	-5.903341	0.0000
T42	-0.133067	0.016461	-8.083804	0.0000
T43	-0.190238	0.017098	-11.12663	0.0000
T44	-0.212734	0.016240	-13.09926	0.0000
T45	-0.250742	0.016103	-15.57156	0.0000
T46	-0.272876	0.016207	-16.83741	0.0000
T47	-0.258851	0.015565	-16.63042	0.0000
T48	-0.250343	0.015962	-15.68327	0.0000
T49	-0.260785	0.015776	-16.53095	0.0000
T50	-0.233638	0.015957	-14.64199	0.0000
T51	-0.268490	0.016747	-16.03235	0.0000
T52	-0.256088	0.016088	-15.91756	0.0000
T53	-0.243650	0.016282	-14.96428	0.0000
T54	-0.240209	0.016461	-14.59266	0.0000
T55	-0.245066	0.016922	-14.48217	0.0000
T56	-0.245668	0.016725	-14.68899	0.0000
T57	-0.245837	0.016679	-14.73963	0.0000
T58	-0.228792	0.016444	-13.91301	0.0000
T59	-0.211757	0.016231	-13.04636	0.0000
T60	-0.174396	0.016246	-10.73502	0.0000
T61	-0.131033	0.016217	-8.079990	0.0000
T62	-0.088600	0.016457	-5.383802	0.0000
T63	-0.025095	0.016268	-1.542632	0.1230
T64	0.009801	0.016562	0.591811	0.5540
T65	0.007182	0.016827	0.426801	0.6695
T66	0.050064	0.016674	3.002556	0.0027
T67	0.048118	0.017795	2.703978	0.0069
T68	-0.001334	0.017699	-0.075396	0.9399
T69	0.000681	0.017761	0.038356	0.9694
T70	0.033810	0.017872	1.891808	0.0586
T71	-0.050181	0.019460	-2.578651	0.0099
T72	-0.118058	0.019338	-6.105088	0.0000
T73	-0.184591	0.020864	-8.847363	0.0000
T74	-0.277530	0.018275	-15.18629	0.0000
T75	-0.231074	0.018179	-12.71127	0.0000
T76	-0.280411	0.019569	-14.32956	0.0000
T77	-0.328778	0.019554	-16.81369	0.0000
T78	-0.460516	0.020586	-22.37081	0.0000
T79	-0.525561	0.020020	-26.25197	0.0000
T80	-0.547637	0.020389	-26.85880	0.0000
T81	-0.609780	0.020413	-29.87250	0.0000
T82	-0.664856	0.020036	-33.18228	0.0000

T83	-0.593635	0.019736	-30.07910	0.0000
T84	-0.553310	0.020931	-26.43530	0.0000
T85	-0.549141	0.021568	-25.46057	0.0000
T86	-0.553821	0.022066	-25.09864	0.0000
T87	-0.554404	0.021917	-25.29509	0.0000
T88	-0.556587	0.021571	-25.80310	0.0000
T89	-0.542726	0.022093	-24.56516	0.0000
T90	-0.555216	0.023117	-24.01739	0.0000
T91	-0.563598	0.022850	-24.66517	0.0000
T92	-0.576418	0.023659	-24.36350	0.0000
T93	-0.611115	0.025424	-24.03728	0.0000
T94	-0.644431	0.024788	-25.99786	0.0000
T95	-0.652663	0.024782	-26.33586	0.0000
T96	-0.647516	0.024903	-26.00138	0.0000
T97	-0.655841	0.025361	-25.86023	0.0000
T98	-0.644001	0.026043	-24.72867	0.0000
T99	-0.635314	0.026266	-24.18732	0.0000
T100	-0.689495	0.028339	-24.32998	0.0000
T101	-0.732882	0.027658	-26.49847	0.0000
T102	-0.753055	0.028093	-26.80624	0.0000
T103	-0.757851	0.028408	-26.67757	0.0000
T104	-0.756015	0.028915	-26.14594	0.0000
T105	-0.755054	0.029085	-25.96020	0.0000
T106	-0.754350	0.030545	-24.69614	0.0000
T107	-0.778493	0.032592	-23.88613	0.0000
T108	-0.826537	0.031918	-25.89560	0.0000
T109	-0.813337	0.032815	-24.78590	0.0000
T110	-0.855750	0.032763	-26.11941	0.0000
T111	-0.826539	0.032798	-25.20057	0.0000
T112	-0.823344	0.033730	-24.40975	0.0000
T113	-0.858669	0.034353	-24.99518	0.0000
T114	-0.838424	0.035137	-23.86163	0.0000
T115	-0.857033	0.033546	-25.54808	0.0000
T116	-0.842302	0.030522	-27.59642	0.0000
T117	-0.868739	0.031196	-27.84820	0.0000
T118	-0.917244	0.028416	-32.27927	0.0000
T119	-0.886485	0.028283	-31.34300	0.0000
T120	-0.889722	0.028942	-30.74188	0.0000
T121	-0.905307	0.032075	-28.22458	0.0000
T122	-0.898126	0.034271	-26.20651	0.0000
T123	-0.910626	0.037294	-24.41755	0.0000
T124	-0.910132	0.039711	-22.91887	0.0000
T125	-0.950799	0.040377	-23.54802	0.0000
T126	-0.963378	0.042358	-22.74372	0.0000
T127	-0.950710	0.043646	-21.78224	0.0000
T128	-0.968948	0.046181	-20.98160	0.0000
T129	-1.013339	0.046222	-21.92335	0.0000
T130	-1.052917	0.046472	-22.65727	0.0000
T131	-1.057226	0.047471	-22.27106	0.0000
T132	-1.057460	0.048203	-21.93766	0.0000

T133	-1.079751	0.048934	-22.06548	0.0000
T134	-1.104615	0.050410	-21.91270	0.0000
T135	-1.143778	0.051001	-22.42637	0.0000
T136	-1.114446	0.051771	-21.52628	0.0000
T137	-1.120040	0.052497	-21.33515	0.0000
T138	-1.179532	0.053376	-22.09855	0.0000
T139	-1.140511	0.054397	-20.96655	0.0000
T140	-1.107691	0.055529	-19.94814	0.0000
T141	-1.112651	0.056018	-19.86235	0.0000
T142	-1.054238	0.056894	-18.52998	0.0000
T143	-1.017516	0.058191	-17.48592	0.0000
T144	-1.020650	0.059241	-17.22880	0.0000
T145	-0.969262	0.060070	-16.13541	0.0000
T146	-0.903385	0.060975	-14.81565	0.0000
T147	-0.849343	0.061871	-13.72768	0.0000
T148	-0.804212	0.063321	-12.70046	0.0000
T149	-0.813243	0.064244	-12.65859	0.0000
T150	-0.881338	0.056771	-15.52449	0.0000
T151	-0.852482	0.051372	-16.59432	0.0000
T152	-0.851177	0.051115	-16.65225	0.0000

R-squared	0.969570	Mean dependent var	3.496385
Adjusted R-squared	0.968741	S.D. dependent var	0.249866
S.E. of regression	0.044177	Akaike info criterion	-3.374926
Sum squared resid	11.46156	Schwarz criterion	-3.196017
Log likelihood	10343.15	F-statistic	1169.562
Durbin-Watson stat	1.970114	Prob(F-statistic)	0.000000

Appendix 10

Results of South Horizon in estimating equation 2

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 15924

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.147888	0.009699	324.5549	0.0000
AGE	2.25E-05	1.75E-06	12.91485	0.0000
AGE^2	-2.06E-09	5.07E-10	-4.059830	0.0000
FL	0.002008	0.000144	13.91009	0.0000
FL^2	-2.78E-05	3.54E-06	-7.857322	0.0000
GFA	0.000178	3.73E-06	47.78385	0.0000
GFA^2	-1.90E-08	7.70E-10	-24.64987	0.0000
LF	0.002795	0.001299	2.152306	0.0314
SV	0.010205	0.000954	10.69396	0.0000
GV	-0.055344	0.002031	-27.24798	0.0000
T2	0.010591	0.012040	0.879627	0.3791
T3	0.045068	0.009375	4.807297	0.0000
T4	0.075689	0.010502	7.206839	0.0000
T5	0.093324	0.011287	8.268074	0.0000
T6	0.129060	0.012401	10.40723	0.0000
T7	0.112443	0.011400	9.863242	0.0000
T8	0.149713	0.009721	15.40056	0.0000
T9	0.149971	0.009775	15.34247	0.0000
T10	0.124415	0.013519	9.202812	0.0000
T11	0.101251	0.013113	7.721664	0.0000
T12	0.039030	0.011918	3.274986	0.0011
T13	0.060273	0.009675	6.229493	0.0000
T14	0.061046	0.011049	5.525064	0.0000
T15	0.077517	0.009911	7.820885	0.0000
T16	0.091868	0.009385	9.788354	0.0000
T17	0.122729	0.009338	13.14322	0.0000
T18	0.162145	0.009739	16.64973	0.0000
T19	0.221546	0.010214	21.69045	0.0000
T20	0.257027	0.011805	21.77258	0.0000
T21	0.242214	0.012773	18.96351	0.0000
T22	0.227629	0.012776	17.81672	0.0000
T23	0.244492	0.011225	21.78158	0.0000
T24	0.278943	0.010681	26.11506	0.0000
T25	0.347262	0.010160	34.17956	0.0000
T26	0.427376	0.011167	38.27212	0.0000
T27	0.507471	0.010199	49.75523	0.0000
T28	0.545765	0.009836	55.48437	0.0000
T29	0.463348	0.013119	35.31920	0.0000
T30	0.488809	0.010878	44.93457	0.0000
T31	0.459349	0.009935	46.23619	0.0000
T32	0.451653	0.010057	44.90811	0.0000

T33	0.458782	0.010213	44.92155	0.0000
T34	0.450714	0.010790	41.77295	0.0000
T35	0.448349	0.011175	40.11893	0.0000
T36	0.399421	0.013136	30.40617	0.0000
T37	0.360276	0.012433	28.97698	0.0000
T38	0.339314	0.011892	28.53293	0.0000
T39	0.369403	0.009319	39.64179	0.0000
T40	0.389774	0.009420	41.37819	0.0000
T41	0.379539	0.011304	33.57668	0.0000
T42	0.340051	0.011591	29.33732	0.0000
T43	0.315927	0.012294	25.69815	0.0000
T44	0.303467	0.012027	25.23285	0.0000
T45	0.274115	0.011655	23.51938	0.0000
T46	0.252937	0.010154	24.90928	0.0000
T47	0.268031	0.010044	26.68616	0.0000
T48	0.282461	0.010596	26.65621	0.0000
T49	0.273521	0.010190	26.84320	0.0000
T50	0.322600	0.009912	32.54789	0.0000
T51	0.360846	0.010477	34.44327	0.0000
T52	0.376954	0.010212	36.91235	0.0000
T53	0.399786	0.010283	38.87743	0.0000
T54	0.406457	0.010448	38.90303	0.0000
T55	0.416772	0.010409	40.03825	0.0000
T56	0.411657	0.010872	37.86300	0.0000
T57	0.424454	0.010492	40.45455	0.0000
T58	0.444481	0.009934	44.74490	0.0000
T59	0.480755	0.009761	49.25117	0.0000
T60	0.528642	0.009850	53.66736	0.0000
T61	0.571425	0.010078	56.69758	0.0000
T62	0.620074	0.010034	61.79499	0.0000
T63	0.690414	0.009643	71.59607	0.0000
T64	0.705899	0.010488	67.30662	0.0000
T65	0.694120	0.009719	71.42237	0.0000
T66	0.746797	0.009705	76.95317	0.0000
T67	0.749482	0.010773	69.56918	0.0000
T68	0.719579	0.010395	69.22057	0.0000
T69	0.740941	0.010594	69.94152	0.0000
T70	0.759672	0.010392	73.10438	0.0000
T71	0.662014	0.011563	57.25157	0.0000
T72	0.616119	0.010477	58.80800	0.0000
T73	0.554226	0.012695	43.65605	0.0000
T74	0.477015	0.010603	44.98664	0.0000
T75	0.516696	0.010543	49.01068	0.0000
T76	0.481394	0.010914	44.10843	0.0000
T77	0.459235	0.011710	39.21854	0.0000
T78	0.298925	0.011335	26.37171	0.0000
T79	0.259093	0.010724	24.16016	0.0000
T80	0.207644	0.011706	17.73802	0.0000
T81	0.140028	0.010974	12.75983	0.0000
T82	0.128627	0.010818	11.89025	0.0000

T83	0.211401	0.010407	20.31335	0.0000
T84	0.254487	0.011538	22.05550	0.0000
T85	0.251155	0.012443	20.18517	0.0000
T86	0.250754	0.012616	19.87611	0.0000
T87	0.253480	0.010912	23.22879	0.0000
T88	0.266450	0.011221	23.74535	0.0000
T89	0.286336	0.011501	24.89750	0.0000
T90	0.273958	0.012763	21.46582	0.0000
T91	0.270791	0.012002	22.56140	0.0000
T92	0.257898	0.012046	21.40921	0.0000
T93	0.211465	0.012838	16.47174	0.0000
T94	0.201132	0.012367	16.26358	0.0000
T95	0.160481	0.011839	13.55491	0.0000
T96	0.190714	0.011279	16.90890	0.0000
T97	0.189129	0.011947	15.83114	0.0000
T98	0.198498	0.012468	15.92047	0.0000
T99	0.212298	0.012202	17.39819	0.0000
T100	0.205228	0.012756	16.08884	0.0000
T101	0.142210	0.013377	10.63105	0.0000
T102	0.088655	0.012320	7.195821	0.0000
T103	0.090081	0.011651	7.731365	0.0000
T104	0.101470	0.011765	8.624824	0.0000
T105	0.121313	0.012263	9.892223	0.0000
T106	0.114367	0.013007	8.793004	0.0000
T107	0.092963	0.013551	6.860084	0.0000
T108	0.060995	0.013366	4.563604	0.0000
T109	0.002445	0.013107	0.186543	0.8520
T110	0.041554	0.012763	3.255803	0.0011
T111	0.070076	0.011291	6.206531	0.0000
T112	0.068931	0.013634	5.055654	0.0000
T113	0.025576	0.011951	2.140148	0.0324
T114	0.007483	0.011996	0.623817	0.5328
T115	0.027548	0.012379	2.225443	0.0261
T116	0.020760	0.012118	1.713202	0.0867
T117	-0.024412	0.012833	-1.902242	0.0572
T118	-0.053649	0.011845	-4.529272	0.0000
T119	-0.051438	0.011997	-4.287587	0.0000
T120	-0.040608	0.011924	-3.405472	0.0007
T121	-0.034201	0.011709	-2.920991	0.0035
T122	-0.073682	0.015134	-4.868643	0.0000
T123	-0.047049	0.012855	-3.659979	0.0003
T124	-0.055393	0.012700	-4.361757	0.0000
T125	-0.066129	0.012731	-5.194407	0.0000
T126	-0.052587	0.012815	-4.103598	0.0000
T127	-0.078379	0.013673	-5.732279	0.0000
T128	-0.117477	0.014101	-8.331269	0.0000
T129	-0.122412	0.015264	-8.019493	0.0000
T130	-0.144201	0.012725	-11.33201	0.0000
T131	-0.168083	0.013093	-12.83740	0.0000
T132	-0.169467	0.013463	-12.58751	0.0000

T133	-0.201543	0.012988	-15.51820	0.0000
T134	-0.251616	0.014491	-17.36315	0.0000
T135	-0.275852	0.013406	-20.57734	0.0000
T136	-0.250643	0.013759	-18.21677	0.0000
T137	-0.274791	0.012740	-21.56892	0.0000
T138	-0.265050	0.012541	-21.13486	0.0000
T139	-0.265166	0.012578	-21.08111	0.0000
T140	-0.241573	0.012251	-19.71943	0.0000
T141	-0.211978	0.012123	-17.48553	0.0000
T142	-0.159499	0.013189	-12.09323	0.0000
T143	-0.118717	0.013802	-8.601557	0.0000
T144	-0.101762	0.013444	-7.569533	0.0000
T145	-0.046499	0.012246	-3.797041	0.0001
T146	0.010450	0.013052	0.800634	0.4234
T147	0.058893	0.012483	4.718012	0.0000
T148	0.089790	0.013416	6.692972	0.0000
T149	0.049667	0.015235	3.260146	0.0011
T150	-0.004147	0.013835	-0.299790	0.7643
T151	0.053944	0.014755	3.656029	0.0003
T152	0.023399	0.015607	1.499267	0.1338

R-squared	0.958861	Mean dependent var	3.600921
Adjusted R-squared	0.958443	S.D. dependent var	0.238157
S.E. of regression	0.048549	Akaike info criterion	-3.202407
Sum squared resid	37.15423	Schwarz criterion	-3.124803
Log likelihood	25658.57	F-statistic	2296.240
Durbin-Watson stat	1.798715	Prob(F-statistic)	0.000000

Appendix 11

Results of Riviera Garden in estimating equation 3

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.131351	0.035067	89.29531	0.0000
AGE	0.000443	2.41E-05	18.34237	0.0000
AGE^2	-4.26E-08	5.25E-09	-8.112834	0.0000
FL	0.002868	0.000205	13.97842	0.0000
FL^2	-4.90E-05	5.25E-06	-9.326853	0.0000
GFA	-0.000886	9.15E-05	-9.674579	0.0000
GFA^2	7.62E-07	6.79E-08	11.22728	0.0000
LF	0.001398	0.001914	0.730236	0.4653
SV	0.037269	0.001473	25.30893	0.0000
FGV	-0.030079	0.001550	-19.40591	0.0000
PGV	-0.008938	0.005217	-1.713139	0.0867
T2	0.015817	0.007588	2.084468	0.0372
T3	0.046267	0.006389	7.241357	0.0000
T4	0.069683	0.007353	9.477325	0.0000
T5	0.082531	0.007586	10.87924	0.0000
T6	0.089430	0.007491	11.93827	0.0000
T7	0.086104	0.007630	11.28432	0.0000
T8	0.064246	0.008860	7.250879	0.0000
T9	0.068602	0.013045	5.258729	0.0000
T10	0.034511	0.010554	3.269824	0.0011
T11	0.007895	0.012019	0.656857	0.5113
T12	-0.027456	0.012426	-2.209494	0.0272
T13	-0.047846	0.011653	-4.105833	0.0000
T14	-0.048805	0.011997	-4.068184	0.0000
T15	-0.053379	0.009159	-5.827833	0.0000
T16	-0.049683	0.009301	-5.341664	0.0000
T17	-0.041141	0.009480	-4.340039	0.0000
T18	-0.066136	0.010308	-6.415863	0.0000
T19	-0.038990	0.010599	-3.678739	0.0002
T20	-0.019853	0.011704	-1.696220	0.0899
T21	-0.041004	0.012976	-3.160126	0.0016
T22	-0.066700	0.013976	-4.772528	0.0000
T23	-0.059182	0.013078	-4.525430	0.0000
T24	-0.038479	0.012644	-3.043162	0.0024
T25	-0.004436	0.011896	-0.372912	0.7092
T26	0.047894	0.012888	3.716206	0.0002
T27	0.120812	0.012393	9.748710	0.0000
T28	0.156637	0.012730	12.30496	0.0000
T29	0.109344	0.016060	6.808369	0.0000
T30	0.104516	0.014200	7.360052	0.0000
T31	0.066361	0.014989	4.427378	0.0000

T32	0.045634	0.013933	3.275131	0.0011
T33	0.024590	0.014195	1.732223	0.0833
T34	0.020348	0.014889	1.366708	0.1718
T35	0.009892	0.015149	0.652957	0.5138
T36	-0.030937	0.015614	-1.981390	0.0476
T37	-0.095888	0.016406	-5.844734	0.0000
T38	-0.116071	0.016128	-7.196796	0.0000
T39	-0.081038	0.014674	-5.522589	0.0000
T40	-0.082986	0.015086	-5.500706	0.0000
T41	-0.093930	0.015892	-5.910558	0.0000
T42	-0.132995	0.016422	-8.098677	0.0000
T43	-0.190292	0.017057	-11.15635	0.0000
T44	-0.213144	0.016202	-13.15558	0.0000
T45	-0.250368	0.016064	-15.58539	0.0000
T46	-0.272926	0.016168	-16.88069	0.0000
T47	-0.258732	0.015528	-16.66243	0.0000
T48	-0.250812	0.015924	-15.75082	0.0000
T49	-0.260911	0.015738	-16.57839	0.0000
T50	-0.234534	0.015918	-14.73389	0.0000
T51	-0.268720	0.016707	-16.08422	0.0000
T52	-0.255706	0.016050	-15.93170	0.0000
T53	-0.243301	0.016243	-14.97844	0.0000
T54	-0.239859	0.016422	-14.60560	0.0000
T55	-0.244597	0.016882	-14.48871	0.0000
T56	-0.245235	0.016685	-14.69792	0.0000
T57	-0.245528	0.016640	-14.75565	0.0000
T58	-0.229844	0.016405	-14.01087	0.0000
T59	-0.211593	0.016193	-13.06733	0.0000
T60	-0.174726	0.016207	-10.78110	0.0000
T61	-0.130672	0.016178	-8.076894	0.0000
T62	-0.088070	0.016418	-5.364258	0.0000
T63	-0.024949	0.016229	-1.537307	0.1243
T64	0.010316	0.016523	0.624335	0.5324
T65	0.007611	0.016787	0.453382	0.6503
T66	0.050143	0.016634	3.014447	0.0026
T67	0.047815	0.017753	2.693271	0.0071
T68	-0.001133	0.017657	-0.064139	0.9489
T69	0.001231	0.017719	0.069474	0.9446
T70	0.033744	0.017830	1.892580	0.0585
T71	-0.049980	0.019414	-2.574462	0.0101
T72	-0.117319	0.019292	-6.081190	0.0000
T73	-0.183994	0.020815	-8.839652	0.0000
T74	-0.277917	0.018232	-15.24329	0.0000
T75	-0.230566	0.018136	-12.71336	0.0000
T76	-0.279862	0.019522	-14.33542	0.0000
T77	-0.329417	0.019507	-16.88720	0.0000
T78	-0.459855	0.020537	-22.39156	0.0000
T79	-0.524911	0.019973	-26.28145	0.0000
T80	-0.547333	0.020341	-26.90779	0.0000
T81	-0.609403	0.020364	-29.92500	0.0000

T82	-0.664885	0.019988	-33.26395	0.0000
T83	-0.593441	0.019689	-30.14120	0.0000
T84	-0.554197	0.020883	-26.53837	0.0000
T85	-0.548437	0.021517	-25.48803	0.0000
T86	-0.553140	0.022014	-25.12703	0.0000
T87	-0.553540	0.021866	-25.31505	0.0000
T88	-0.556424	0.021519	-25.85693	0.0000
T89	-0.543617	0.022039	-24.66611	0.0000
T90	-0.555769	0.023061	-24.09947	0.0000
T91	-0.562965	0.022796	-24.69585	0.0000
T92	-0.575412	0.023604	-24.37805	0.0000
T93	-0.610079	0.025364	-24.05294	0.0000
T94	-0.643462	0.024730	-26.01983	0.0000
T95	-0.652003	0.024724	-26.37159	0.0000
T96	-0.646581	0.024845	-26.02500	0.0000
T97	-0.655160	0.025301	-25.89458	0.0000
T98	-0.644009	0.025981	-24.78778	0.0000
T99	-0.634581	0.026204	-24.21664	0.0000
T100	-0.688368	0.028273	-24.34731	0.0000
T101	-0.731865	0.027593	-26.52403	0.0000
T102	-0.751836	0.028027	-26.82554	0.0000
T103	-0.756843	0.028341	-26.70491	0.0000
T104	-0.755708	0.028847	-26.19748	0.0000
T105	-0.754189	0.029016	-25.99181	0.0000
T106	-0.755738	0.030472	-24.80133	0.0000
T107	-0.777291	0.032515	-23.90542	0.0000
T108	-0.825514	0.031843	-25.92465	0.0000
T109	-0.812195	0.032737	-24.80944	0.0000
T110	-0.854872	0.032686	-26.15447	0.0000
T111	-0.826147	0.032721	-25.24855	0.0000
T112	-0.823238	0.033650	-24.46470	0.0000
T113	-0.857554	0.034272	-25.02169	0.0000
T114	-0.837357	0.035054	-23.88760	0.0000
T115	-0.856060	0.033467	-25.57946	0.0000
T116	-0.841315	0.030450	-27.62922	0.0000
T117	-0.868735	0.031122	-27.91421	0.0000
T118	-0.916384	0.028349	-32.32531	0.0000
T119	-0.885570	0.028217	-31.38464	0.0000
T120	-0.888656	0.028874	-30.77735	0.0000
T121	-0.905510	0.031999	-28.29813	0.0000
T122	-0.897115	0.034190	-26.23895	0.0000
T123	-0.909380	0.037206	-24.44168	0.0000
T124	-0.908723	0.039618	-22.93733	0.0000
T125	-0.949620	0.040282	-23.57447	0.0000
T126	-0.961915	0.042258	-22.76272	0.0000
T127	-0.948931	0.043544	-21.79249	0.0000
T128	-0.967700	0.046072	-21.00425	0.0000
T129	-1.011953	0.046113	-21.94513	0.0000
T130	-1.051425	0.046362	-22.67858	0.0000
T131	-1.055811	0.047359	-22.29386	0.0000

T132	-1.056145	0.048089	-21.96227	0.0000
T133	-1.078067	0.048819	-22.08301	0.0000
T134	-1.102958	0.050291	-21.93152	0.0000
T135	-1.144249	0.050880	-22.48895	0.0000
T136	-1.112844	0.051649	-21.54615	0.0000
T137	-1.118120	0.052374	-21.34872	0.0000
T138	-1.177750	0.053250	-22.11725	0.0000
T139	-1.139864	0.054268	-21.00453	0.0000
T140	-1.106150	0.055397	-19.96755	0.0000
T141	-1.111391	0.055885	-19.88696	0.0000
T142	-1.055549	0.056758	-18.59736	0.0000
T143	-1.015644	0.058053	-17.49497	0.0000
T144	-1.020238	0.059101	-17.26270	0.0000
T145	-0.968356	0.059928	-16.15863	0.0000
T146	-0.903533	0.060831	-14.85327	0.0000
T147	-0.848530	0.061724	-13.74713	0.0000
T148	-0.802358	0.063172	-12.70117	0.0000
T149	-0.812656	0.064092	-12.67958	0.0000
T150	-0.879457	0.056637	-15.52791	0.0000
T151	-0.850700	0.051251	-16.59867	0.0000
T152	-0.850429	0.050994	-16.67713	0.0000

R-squared	0.969720	Mean dependent var	3.496385
Adjusted R-squared	0.968890	S.D. dependent var	0.249866
S.E. of regression	0.044072	Akaike info criterion	-3.379524
Sum squared resid	11.40519	Schwarz criterion	-3.199505
Log likelihood	10358.02	F-statistic	1168.023
Durbin-Watson stat	1.971524	Prob(F-statistic)	0.000000

Appendix 12

Results of South Horizon in estimating equation 3

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 15924

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.147589	0.009692	324.7641	0.0000
AGE	2.26E-05	1.74E-06	12.94757	0.0000
AGE^2	-2.07E-09	5.07E-10	-4.079292	0.0000
FL	0.002001	0.000144	13.87040	0.0000
FL^2	-2.76E-05	3.54E-06	-7.801335	0.0000
GFA	0.000178	3.73E-06	47.70733	0.0000
GFA^2	-1.89E-08	7.70E-10	-24.61765	0.0000
LF	0.002754	0.001298	2.121858	0.0339
SV	0.010246	0.000954	10.74507	0.0000
FGV	-0.061697	0.002395	-25.75664	0.0000
PGV	-0.043471	0.003126	-13.90628	0.0000
T2	0.010930	0.012031	0.908490	0.3636
T3	0.045738	0.009369	4.882022	0.0000
T4	0.076228	0.010495	7.263264	0.0000
T5	0.093886	0.011279	8.323771	0.0000
T6	0.129732	0.012392	10.46877	0.0000
T7	0.112870	0.011392	9.907925	0.0000
T8	0.150466	0.009715	15.48794	0.0000
T9	0.150671	0.009768	15.42422	0.0000
T10	0.125598	0.013511	9.295898	0.0000
T11	0.103318	0.013109	7.881390	0.0000
T12	0.040130	0.011911	3.369244	0.0008
T13	0.060971	0.009669	6.305820	0.0000
T14	0.061866	0.011042	5.602938	0.0000
T15	0.078433	0.009906	7.918014	0.0000
T16	0.092566	0.009379	9.869145	0.0000
T17	0.123356	0.009332	13.21912	0.0000
T18	0.162393	0.009731	16.68763	0.0000
T19	0.222253	0.010207	21.77415	0.0000
T20	0.257655	0.011797	21.84114	0.0000
T21	0.241635	0.012763	18.93182	0.0000
T22	0.228859	0.012769	17.92326	0.0000
T23	0.245540	0.011218	21.88777	0.0000
T24	0.279650	0.010674	26.19878	0.0000
T25	0.347642	0.010152	34.24206	0.0000
T26	0.427572	0.011158	38.31853	0.0000
T27	0.507547	0.010192	49.80037	0.0000
T28	0.546368	0.009830	55.58365	0.0000
T29	0.463968	0.013110	35.39173	0.0000
T30	0.489357	0.010871	45.01682	0.0000
T31	0.459982	0.009928	46.33122	0.0000

T32	0.452225	0.010050	44.99617	0.0000
T33	0.459488	0.010206	45.02050	0.0000
T34	0.451013	0.010782	41.83176	0.0000
T35	0.449060	0.011168	40.20982	0.0000
T36	0.400264	0.013127	30.49093	0.0000
T37	0.361430	0.012426	29.08682	0.0000
T38	0.340950	0.011887	28.68139	0.0000
T39	0.369969	0.009312	39.72970	0.0000
T40	0.390390	0.009413	41.47155	0.0000
T41	0.380594	0.011297	33.68964	0.0000
T42	0.340914	0.011584	29.43083	0.0000
T43	0.315854	0.012284	25.71170	0.0000
T44	0.303469	0.012018	25.25223	0.0000
T45	0.274981	0.011647	23.60895	0.0000
T46	0.253807	0.010148	25.01021	0.0000
T47	0.268437	0.010037	26.74599	0.0000
T48	0.283063	0.010589	26.73155	0.0000
T49	0.273974	0.010182	26.90703	0.0000
T50	0.323299	0.009905	32.63991	0.0000
T51	0.361508	0.010469	34.52982	0.0000
T52	0.377795	0.010206	37.01778	0.0000
T53	0.400596	0.010277	38.98094	0.0000
T54	0.406885	0.010440	38.97221	0.0000
T55	0.417190	0.010402	40.10750	0.0000
T56	0.412513	0.010865	37.96576	0.0000
T57	0.424569	0.010484	40.49613	0.0000
T58	0.444940	0.009927	44.82325	0.0000
T59	0.481275	0.009754	49.33901	0.0000
T60	0.529152	0.009843	53.75699	0.0000
T61	0.572319	0.010072	56.82042	0.0000
T62	0.620854	0.010028	61.91218	0.0000
T63	0.690817	0.009636	71.68976	0.0000
T64	0.706365	0.010480	67.39951	0.0000
T65	0.694550	0.009712	71.51802	0.0000
T66	0.747395	0.009698	77.06740	0.0000
T67	0.750055	0.010766	69.67128	0.0000
T68	0.720228	0.010388	69.33016	0.0000
T69	0.741466	0.010586	70.04070	0.0000
T70	0.760031	0.010384	73.19272	0.0000
T71	0.662581	0.011555	57.34134	0.0000
T72	0.616763	0.010470	58.90969	0.0000
T73	0.554791	0.012686	43.73196	0.0000
T74	0.477602	0.010596	45.07336	0.0000
T75	0.517446	0.010536	49.11412	0.0000
T76	0.482055	0.010906	44.19922	0.0000
T77	0.459818	0.011701	39.29616	0.0000
T78	0.299508	0.011327	26.44176	0.0000
T79	0.259685	0.010716	24.23226	0.0000
T80	0.207855	0.011697	17.76946	0.0000
T81	0.140299	0.010966	12.79402	0.0000

T82	0.128776	0.010810	11.91308	0.0000
T83	0.211878	0.010400	20.37374	0.0000
T84	0.255415	0.011531	22.14986	0.0000
T85	0.251573	0.012433	20.23366	0.0000
T86	0.251159	0.012607	19.92292	0.0000
T87	0.253843	0.010904	23.27922	0.0000
T88	0.267026	0.011213	23.81348	0.0000
T89	0.286913	0.011492	24.96536	0.0000
T90	0.273970	0.012753	21.48310	0.0000
T91	0.271657	0.011995	22.64834	0.0000
T92	0.258738	0.012038	21.49320	0.0000
T93	0.212235	0.012829	16.54307	0.0000
T94	0.201851	0.012358	16.33299	0.0000
T95	0.160943	0.011831	13.60387	0.0000
T96	0.191026	0.011271	16.94916	0.0000
T97	0.189426	0.011938	15.86785	0.0000
T98	0.199230	0.012460	15.99016	0.0000
T99	0.212597	0.012193	17.43572	0.0000
T100	0.205989	0.012747	16.15963	0.0000
T101	0.143007	0.013368	10.69801	0.0000
T102	0.089074	0.012311	7.235181	0.0000
T103	0.090559	0.011643	7.778030	0.0000
T104	0.102050	0.011756	8.680298	0.0000
T105	0.122512	0.012257	9.995640	0.0000
T106	0.115132	0.012998	8.857866	0.0000
T107	0.093517	0.013542	6.905973	0.0000
T108	0.061787	0.013356	4.626030	0.0000
T109	0.002428	0.013097	0.185391	0.8529
T110	0.042119	0.012754	3.302437	0.0010
T111	0.070645	0.011283	6.261349	0.0000
T112	0.069293	0.013624	5.085997	0.0000
T113	0.026275	0.011943	2.200095	0.0278
T114	0.008563	0.011989	0.714291	0.4751
T115	0.028141	0.012370	2.274936	0.0229
T116	0.021208	0.012109	1.751426	0.0799
T117	-0.024191	0.012824	-1.886449	0.0593
T118	-0.053073	0.011837	-4.483826	0.0000
T119	-0.050496	0.011989	-4.211708	0.0000
T120	-0.040242	0.011916	-3.377314	0.0007
T121	-0.033719	0.011700	-2.881886	0.0040
T122	-0.073123	0.015123	-4.835257	0.0000
T123	-0.046318	0.012846	-3.605635	0.0003
T124	-0.055278	0.012690	-4.355966	0.0000
T125	-0.065713	0.012721	-5.165527	0.0000
T126	-0.052163	0.012805	-4.073561	0.0000
T127	-0.077574	0.013664	-5.677316	0.0000
T128	-0.116392	0.014092	-8.259566	0.0000
T129	-0.121498	0.015254	-7.965069	0.0000
T130	-0.143294	0.012717	-11.26815	0.0000
T131	-0.168230	0.013083	-12.85832	0.0000

T132	-0.169072	0.013453	-12.56752	0.0000
T133	-0.200423	0.012980	-15.44137	0.0000
T134	-0.251006	0.014481	-17.33357	0.0000
T135	-0.274871	0.013397	-20.51752	0.0000
T136	-0.249840	0.013749	-18.17094	0.0000
T137	-0.274500	0.012731	-21.56216	0.0000
T138	-0.264860	0.012531	-21.13561	0.0000
T139	-0.264304	0.012570	-21.02656	0.0000
T140	-0.240854	0.012242	-19.67424	0.0000
T141	-0.211485	0.012114	-17.45753	0.0000
T142	-0.158375	0.013181	-12.01538	0.0000
T143	-0.117446	0.013794	-8.514499	0.0000
T144	-0.101668	0.013433	-7.568265	0.0000
T145	-0.046105	0.012237	-3.767589	0.0002
T146	0.011027	0.013042	0.845505	0.3978
T147	0.059381	0.012473	4.760622	0.0000
T148	0.090370	0.013406	6.741060	0.0000
T149	0.050300	0.015224	3.304060	0.0010
T150	-0.003572	0.013825	-0.258380	0.7961
T151	0.054815	0.014745	3.717671	0.0002
T152	0.023315	0.015595	1.494981	0.1349

R-squared	0.958926	Mean dependent var	3.600921
Adjusted R-squared	0.958506	S.D. dependent var	0.238157
S.E. of regression	0.048513	Akaike info criterion	-3.203862
Sum squared resid	37.09554	Schwarz criterion	-3.125776
Log likelihood	25671.15	F-statistic	2285.598
Durbin-Watson stat	1.798218	Prob(F-statistic)	0.000000

Appendix 13

Results of Riviera Garden in estimating equation 4

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.131537	0.035073	89.28529	0.0000
AGE	0.000443	2.41E-05	18.34260	0.0000
AGE^2	-4.26E-08	5.25E-09	-8.108155	0.0000
FL	0.002871	0.000205	13.98582	0.0000
FL^2	-4.91E-05	5.25E-06	-9.336942	0.0000
GFA	-0.000887	9.16E-05	-9.688952	0.0000
GFA^2	7.63E-07	6.79E-08	11.23951	0.0000
LF	0.001373	0.001914	0.717254	0.4732
SV	0.037280	0.001473	25.31347	0.0000
FGV	-0.027571	0.002820	-9.778702	0.0000
PGV	-0.007634	0.008168	-0.934648	0.3500
FGVXT	-4.11E-05	3.82E-05	-1.073564	0.2831
PGVXT	-3.23E-05	0.000122	-0.263596	0.7921
T2	0.015903	0.007589	2.095505	0.0362
T3	0.046232	0.006390	7.235220	0.0000
T4	0.069534	0.007356	9.453010	0.0000
T5	0.082641	0.007588	10.89089	0.0000
T6	0.089079	0.007499	11.87937	0.0000
T7	0.085859	0.007635	11.24590	0.0000
T8	0.064284	0.008862	7.253920	0.0000
T9	0.068433	0.013047	5.245013	0.0000
T10	0.034457	0.010555	3.264455	0.0011
T11	0.007825	0.012020	0.651006	0.5151
T12	-0.027774	0.012439	-2.232732	0.0256
T13	-0.048131	0.011662	-4.127246	0.0000
T14	-0.049019	0.011999	-4.085134	0.0000
T15	-0.053375	0.009161	-5.826508	0.0000
T16	-0.049681	0.009302	-5.341050	0.0000
T17	-0.041143	0.009480	-4.339875	0.0000
T18	-0.066235	0.010309	-6.424683	0.0000
T19	-0.039078	0.010600	-3.686685	0.0002
T20	-0.019932	0.011705	-1.702749	0.0887
T21	-0.041035	0.012978	-3.162003	0.0016
T22	-0.066903	0.013979	-4.786077	0.0000
T23	-0.059341	0.013079	-4.537032	0.0000
T24	-0.038600	0.012646	-3.052414	0.0023
T25	-0.004482	0.011897	-0.376761	0.7064
T26	0.047659	0.012891	3.697171	0.0002
T27	0.120798	0.012394	9.746668	0.0000
T28	0.156514	0.012731	12.29398	0.0000
T29	0.109150	0.016063	6.795215	0.0000

T30	0.104669	0.014202	7.369959	0.0000
T31	0.066259	0.014990	4.420152	0.0000
T32	0.045639	0.013934	3.275234	0.0011
T33	0.024528	0.014197	1.727687	0.0841
T34	0.020454	0.014890	1.373676	0.1696
T35	0.009845	0.015150	0.649845	0.5158
T36	-0.030972	0.015615	-1.983424	0.0474
T37	-0.095869	0.016407	-5.843144	0.0000
T38	-0.116101	0.016129	-7.198079	0.0000
T39	-0.081020	0.014675	-5.520900	0.0000
T40	-0.083025	0.015088	-5.502756	0.0000
T41	-0.093958	0.015893	-5.911786	0.0000
T42	-0.132978	0.016423	-8.097011	0.0000
T43	-0.190232	0.017058	-11.15196	0.0000
T44	-0.213163	0.016203	-13.15571	0.0000
T45	-0.250451	0.016066	-15.58895	0.0000
T46	-0.272872	0.016169	-16.87600	0.0000
T47	-0.258708	0.015529	-16.65950	0.0000
T48	-0.250799	0.015925	-15.74876	0.0000
T49	-0.260901	0.015739	-16.57638	0.0000
T50	-0.234553	0.015919	-14.73384	0.0000
T51	-0.268733	0.016708	-16.08379	0.0000
T52	-0.255763	0.016052	-15.93383	0.0000
T53	-0.243339	0.016245	-14.97961	0.0000
T54	-0.239866	0.016424	-14.60491	0.0000
T55	-0.244638	0.016883	-14.49000	0.0000
T56	-0.245265	0.016686	-14.69860	0.0000
T57	-0.245520	0.016641	-14.75408	0.0000
T58	-0.229840	0.016406	-14.00958	0.0000
T59	-0.211605	0.016194	-13.06707	0.0000
T60	-0.174724	0.016208	-10.78020	0.0000
T61	-0.130682	0.016180	-8.076932	0.0000
T62	-0.088072	0.016419	-5.364028	0.0000
T63	-0.024946	0.016230	-1.537018	0.1243
T64	0.010319	0.016524	0.624526	0.5323
T65	0.007603	0.016789	0.452884	0.6506
T66	0.050160	0.016635	3.015227	0.0026
T67	0.047824	0.017755	2.693614	0.0071
T68	-0.001160	0.017659	-0.065665	0.9476
T69	0.001232	0.017721	0.069522	0.9446
T70	0.033749	0.017831	1.892732	0.0584
T71	-0.050023	0.019415	-2.576498	0.0100
T72	-0.117267	0.019293	-6.078085	0.0000
T73	-0.183965	0.020816	-8.837647	0.0000
T74	-0.277877	0.018234	-15.23972	0.0000
T75	-0.230576	0.018137	-12.71308	0.0000
T76	-0.279831	0.019524	-14.33282	0.0000
T77	-0.329447	0.019508	-16.88760	0.0000
T78	-0.459766	0.020538	-22.38559	0.0000
T79	-0.524881	0.019974	-26.27816	0.0000

T80	-0.547459	0.020343	-26.91175	0.0000
T81	-0.609461	0.020366	-29.92574	0.0000
T82	-0.664786	0.019990	-33.25637	0.0000
T83	-0.593401	0.019690	-30.13706	0.0000
T84	-0.554140	0.020886	-26.53217	0.0000
T85	-0.548331	0.021519	-25.48103	0.0000
T86	-0.553149	0.022015	-25.12572	0.0000
T87	-0.553466	0.021868	-25.30976	0.0000
T88	-0.556423	0.021521	-25.85512	0.0000
T89	-0.543522	0.022041	-24.65983	0.0000
T90	-0.555740	0.023063	-24.09643	0.0000
T91	-0.562996	0.022798	-24.69543	0.0000
T92	-0.575185	0.023606	-24.36559	0.0000
T93	-0.609993	0.025366	-24.04764	0.0000
T94	-0.643336	0.024732	-26.01243	0.0000
T95	-0.652047	0.024726	-26.37140	0.0000
T96	-0.646524	0.024847	-26.02060	0.0000
T97	-0.655248	0.025303	-25.89602	0.0000
T98	-0.643998	0.025983	-24.78552	0.0000
T99	-0.634676	0.026206	-24.21830	0.0000
T100	-0.688128	0.028276	-24.33597	0.0000
T101	-0.731775	0.027595	-26.51846	0.0000
T102	-0.751596	0.028030	-26.81380	0.0000
T103	-0.756734	0.028344	-26.69864	0.0000
T104	-0.755603	0.028849	-26.19193	0.0000
T105	-0.754238	0.029019	-25.99137	0.0000
T106	-0.755653	0.030474	-24.79651	0.0000
T107	-0.777224	0.032518	-23.90131	0.0000
T108	-0.825480	0.031846	-25.92135	0.0000
T109	-0.812091	0.032740	-24.80398	0.0000
T110	-0.855100	0.032689	-26.15887	0.0000
T111	-0.826257	0.032723	-25.25013	0.0000
T112	-0.823090	0.033653	-24.45785	0.0000
T113	-0.857530	0.034275	-25.01875	0.0000
T114	-0.837372	0.035057	-23.88598	0.0000
T115	-0.856137	0.033470	-25.57958	0.0000
T116	-0.841309	0.030453	-27.62670	0.0000
T117	-0.868266	0.031128	-27.89356	0.0000
T118	-0.916335	0.028351	-32.32090	0.0000
T119	-0.885499	0.028219	-31.37942	0.0000
T120	-0.888289	0.028878	-30.75964	0.0000
T121	-0.905630	0.032002	-28.29940	0.0000
T122	-0.897055	0.034193	-26.23490	0.0000
T123	-0.909265	0.037210	-24.43619	0.0000
T124	-0.908580	0.039622	-22.93142	0.0000
T125	-0.949796	0.040285	-23.57662	0.0000
T126	-0.961569	0.042264	-22.75153	0.0000
T127	-0.948376	0.043552	-21.77581	0.0000
T128	-0.968150	0.046077	-21.01151	0.0000
T129	-1.011896	0.046117	-21.94182	0.0000

T130	-1.051316	0.046367	-22.67398	0.0000
T131	-1.055868	0.047363	-22.29301	0.0000
T132	-1.056411	0.048094	-21.96561	0.0000
T133	-1.077858	0.048824	-22.07635	0.0000
T134	-1.102958	0.050296	-21.92946	0.0000
T135	-1.144317	0.050885	-22.48819	0.0000
T136	-1.112918	0.051654	-21.54554	0.0000
T137	-1.117598	0.052382	-21.33546	0.0000
T138	-1.177711	0.053256	-22.11432	0.0000
T139	-1.139689	0.054272	-20.99973	0.0000
T140	-1.106277	0.055403	-19.96794	0.0000
T141	-1.110809	0.055892	-19.87424	0.0000
T142	-1.055595	0.056762	-18.59673	0.0000
T143	-1.015573	0.058059	-17.49198	0.0000
T144	-1.020344	0.059106	-17.26282	0.0000
T145	-0.967273	0.059941	-16.13706	0.0000
T146	-0.903896	0.060837	-14.85768	0.0000
T147	-0.848507	0.061729	-13.74575	0.0000
T148	-0.802476	0.063178	-12.70179	0.0000
T149	-0.813091	0.064097	-12.68525	0.0000
T150	-0.879093	0.056644	-15.51952	0.0000
T151	-0.850284	0.051258	-16.58827	0.0000
T152	-0.849736	0.051001	-16.66101	0.0000

R-squared	0.969726	Mean dependent var	3.496385
Adjusted R-squared	0.968886	S.D. dependent var	0.249866
S.E. of regression	0.044074	Akaike info criterion	-3.379070
Sum squared resid	11.40281	Schwarz criterion	-3.196828
Log likelihood	10358.65	F-statistic	1153.546
Durbin-Watson stat	1.970587	Prob(F-statistic)	0.000000

Appendix 14

Results of South Horizon in estimating equation 4

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 15924

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.145946	0.009710	323.9746	0.0000
AGE	2.14E-05	1.81E-06	11.83594	0.0000
AGE^2	-1.59E-09	5.43E-10	-2.923555	0.0035
FL	0.002002	0.000144	13.88074	0.0000
FL^2	-2.76E-05	3.54E-06	-7.801394	0.0000
GFA	0.000178	3.73E-06	47.75311	0.0000
GFA^2	-1.90E-08	7.70E-10	-24.64583	0.0000
LF	0.002798	0.001298	2.155821	0.0311
SV	0.010212	0.000954	10.70931	0.0000
FGV	-0.056793	0.004002	-14.19126	0.0000
PGV	-0.033252	0.005419	-6.136043	0.0000
FGVXT	-8.77E-05	5.74E-05	-1.527576	0.1266
PGVXT	-0.000179	7.75E-05	-2.310345	0.0209
T2	0.010713	0.012031	0.890512	0.3732
T3	0.046406	0.009371	4.951935	0.0000
T4	0.076200	0.010495	7.260913	0.0000
T5	0.094032	0.011278	8.337295	0.0000
T6	0.129712	0.012392	10.46741	0.0000
T7	0.113383	0.011392	9.952954	0.0000
T8	0.151243	0.009719	15.56228	0.0000
T9	0.151430	0.009772	15.49694	0.0000
T10	0.126065	0.013512	9.329554	0.0000
T11	0.102962	0.013121	7.847330	0.0000
T12	0.041151	0.011916	3.453389	0.0006
T13	0.062054	0.009676	6.413012	0.0000
T14	0.063445	0.011056	5.738401	0.0000
T15	0.079899	0.009920	8.054540	0.0000
T16	0.093679	0.009387	9.979192	0.0000
T17	0.124394	0.009338	13.32057	0.0000
T18	0.163359	0.009737	16.77757	0.0000
T19	0.223319	0.010214	21.86478	0.0000
T20	0.259002	0.011806	21.93824	0.0000
T21	0.242747	0.012770	19.00898	0.0000
T22	0.230347	0.012779	18.02471	0.0000
T23	0.247087	0.011232	21.99906	0.0000
T24	0.281094	0.010686	26.30369	0.0000
T25	0.349135	0.010167	34.34037	0.0000
T26	0.429215	0.011175	38.40976	0.0000
T27	0.508785	0.010201	49.87522	0.0000
T28	0.547568	0.009839	55.65503	0.0000
T29	0.465719	0.013124	35.48498	0.0000

T30	0.490903	0.010885	45.10018	0.0000
T31	0.461336	0.009940	46.41305	0.0000
T32	0.453677	0.010064	45.08008	0.0000
T33	0.461103	0.010223	45.10459	0.0000
T34	0.452714	0.010800	41.91932	0.0000
T35	0.450917	0.011189	40.30164	0.0000
T36	0.402205	0.013146	30.59512	0.0000
T37	0.363306	0.012444	29.19459	0.0000
T38	0.342748	0.011905	28.78997	0.0000
T39	0.371428	0.009327	39.82240	0.0000
T40	0.391861	0.009428	41.56148	0.0000
T41	0.382390	0.011316	33.79249	0.0000
T42	0.342735	0.011602	29.53987	0.0000
T43	0.317783	0.012305	25.82515	0.0000
T44	0.305428	0.012039	25.36896	0.0000
T45	0.277000	0.011671	23.73403	0.0000
T46	0.255688	0.010172	25.13691	0.0000
T47	0.270332	0.010061	26.86889	0.0000
T48	0.285070	0.010615	26.85460	0.0000
T49	0.276013	0.010211	27.03186	0.0000
T50	0.325321	0.009934	32.74930	0.0000
T51	0.363549	0.010497	34.63371	0.0000
T52	0.379833	0.010234	37.11494	0.0000
T53	0.402663	0.010306	39.07227	0.0000
T54	0.408959	0.010469	39.06364	0.0000
T55	0.419275	0.010431	40.19551	0.0000
T56	0.414610	0.010893	38.06043	0.0000
T57	0.426668	0.010513	40.58308	0.0000
T58	0.447052	0.009958	44.89370	0.0000
T59	0.483393	0.009787	49.39264	0.0000
T60	0.531280	0.009876	53.79676	0.0000
T61	0.574453	0.010104	56.85282	0.0000
T62	0.622992	0.010060	61.92738	0.0000
T63	0.692957	0.009670	71.66365	0.0000
T64	0.708506	0.010511	67.40761	0.0000
T65	0.696677	0.009744	71.49622	0.0000
T66	0.749501	0.009730	77.02914	0.0000
T67	0.752225	0.010796	69.67503	0.0000
T68	0.722401	0.010420	69.32609	0.0000
T69	0.743664	0.010618	70.03681	0.0000
T70	0.762209	0.010416	73.17799	0.0000
T71	0.664756	0.011583	57.38865	0.0000
T72	0.619013	0.010504	58.93205	0.0000
T73	0.556881	0.012709	43.81619	0.0000
T74	0.479722	0.010626	45.14750	0.0000
T75	0.519505	0.010564	49.17841	0.0000
T76	0.484109	0.010933	44.27890	0.0000
T77	0.461875	0.011726	39.38879	0.0000
T78	0.301627	0.011354	26.56458	0.0000
T79	0.261835	0.010747	24.36448	0.0000

T80	0.209985	0.011724	17.91132	0.0000
T81	0.142430	0.010994	12.95491	0.0000
T82	0.130775	0.010835	12.07020	0.0000
T83	0.214048	0.010431	20.52013	0.0000
T84	0.257534	0.011559	22.28040	0.0000
T85	0.253656	0.012457	20.36278	0.0000
T86	0.253176	0.012628	20.04883	0.0000
T87	0.255977	0.010933	23.41341	0.0000
T88	0.268912	0.011235	23.93607	0.0000
T89	0.288843	0.011514	25.08554	0.0000
T90	0.276308	0.012782	21.61752	0.0000
T91	0.273682	0.012018	22.77200	0.0000
T92	0.260610	0.012058	21.61302	0.0000
T93	0.213908	0.012843	16.65531	0.0000
T94	0.203566	0.012374	16.45109	0.0000
T95	0.162937	0.011853	13.74623	0.0000
T96	0.193069	0.011295	17.09263	0.0000
T97	0.191079	0.011952	15.98684	0.0000
T98	0.200837	0.012473	16.10209	0.0000
T99	0.214578	0.012214	17.56763	0.0000
T100	0.207651	0.012761	16.27221	0.0000
T101	0.144641	0.013380	10.80997	0.0000
T102	0.090588	0.012323	7.351339	0.0000
T103	0.092276	0.011659	7.914406	0.0000
T104	0.103750	0.011772	8.812943	0.0000
T105	0.124462	0.012280	10.13565	0.0000
T106	0.116428	0.013005	8.952558	0.0000
T107	0.094839	0.013549	6.999893	0.0000
T108	0.062900	0.013361	4.707741	0.0000
T109	0.004370	0.013116	0.333171	0.7390
T110	0.043329	0.012760	3.395650	0.0007
T111	0.071901	0.011291	6.367990	0.0000
T112	0.070656	0.013632	5.183122	0.0000
T113	0.027678	0.011953	2.315657	0.0206
T114	0.009655	0.011995	0.804986	0.4208
T115	0.029358	0.012377	2.372033	0.0177
T116	0.022299	0.012114	1.840727	0.0657
T117	-0.022981	0.012831	-1.791096	0.0733
T118	-0.052049	0.011841	-4.395612	0.0000
T119	-0.049602	0.011992	-4.136110	0.0000
T120	-0.039199	0.011921	-3.288298	0.0010
T121	-0.032697	0.011705	-2.793458	0.0052
T122	-0.072681	0.015122	-4.806296	0.0000
T123	-0.045700	0.012846	-3.557439	0.0004
T124	-0.054331	0.012695	-4.279648	0.0000
T125	-0.064590	0.012727	-5.075063	0.0000
T126	-0.051403	0.012807	-4.013545	0.0001
T127	-0.077190	0.013663	-5.649710	0.0000
T128	-0.115919	0.014091	-8.226572	0.0000
T129	-0.121283	0.015252	-7.952049	0.0000

T130	-0.142865	0.012716	-11.23529	0.0000
T131	-0.167616	0.013089	-12.80550	0.0000
T132	-0.168713	0.013454	-12.54025	0.0000
T133	-0.199649	0.012982	-15.37937	0.0000
T134	-0.250108	0.014483	-17.26937	0.0000
T135	-0.274529	0.013395	-20.49425	0.0000
T136	-0.249725	0.013748	-18.16498	0.0000
T137	-0.274055	0.012732	-21.52404	0.0000
T138	-0.264769	0.012535	-21.12250	0.0000
T139	-0.264633	0.012569	-21.05372	0.0000
T140	-0.240832	0.012241	-19.67404	0.0000
T141	-0.211424	0.012115	-17.45164	0.0000
T142	-0.158527	0.013179	-12.02867	0.0000
T143	-0.117436	0.013792	-8.514873	0.0000
T144	-0.100999	0.013438	-7.515747	0.0000
T145	-0.046449	0.012241	-3.794422	0.0001
T146	0.009968	0.013052	0.763700	0.4451
T147	0.059248	0.012475	4.749375	0.0000
T148	0.088655	0.013428	6.602192	0.0000
T149	0.051075	0.015224	3.354850	0.0008
T150	-0.005421	0.013849	-0.391433	0.6955
T151	0.053467	0.014754	3.623902	0.0003
T152	0.022859	0.015606	1.464728	0.1430

R-squared	0.958944	Mean dependent var	3.600921
Adjusted R-squared	0.958519	S.D. dependent var	0.238157
S.E. of regression	0.048505	Akaike info criterion	-3.204054
Sum squared resid	37.07913	Schwarz criterion	-3.125003
Log likelihood	25674.67	F-statistic	2258.309
Durbin-Watson stat	1.798457	Prob(F-statistic)	0.000000

Appendix 15

Results of Riviera Garden in estimating equation 5

Dependent Variable: LOGDP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.129899	0.035050	89.29686	0.0000
AGE	0.000443	2.41E-05	18.37517	0.0000
AGE^2	-4.27E-08	5.25E-09	-8.130049	0.0000
FL	0.002861	0.000205	13.95268	0.0000
FL^2	-4.88E-05	5.25E-06	-9.299650	0.0000
GFA	-0.000884	9.15E-05	-9.660356	0.0000
GFA^2	7.61E-07	6.79E-08	11.22020	0.0000
LF	0.001580	0.001914	0.825522	0.4091
SV	0.037353	0.001472	25.37784	0.0000
FGV	-0.027148	0.001854	-14.64655	0.0000
PGV	-0.003976	0.006257	-0.635504	0.5251
PEAKXFGV	-0.010607	0.003486	-3.042874	0.0024
PEAKXPGV	-0.019702	0.012037	-1.636864	0.1017
BOTTOMXFGV	-0.002853	0.006784	-0.420582	0.6741
BOTTOMXPGV	0.003977	0.023515	0.169118	0.8657
T2	0.015903	0.007583	2.097250	0.0360
T3	0.046205	0.006385	7.236744	0.0000
T4	0.069348	0.007348	9.437121	0.0000
T5	0.082589	0.007581	10.89403	0.0000
T6	0.088780	0.007488	11.85588	0.0000
T7	0.085566	0.007627	11.21911	0.0000
T8	0.064087	0.008855	7.237705	0.0000
T9	0.068244	0.013037	5.234812	0.0000
T10	0.034323	0.010547	3.254299	0.0011
T11	0.007655	0.012011	0.637343	0.5239
T12	-0.028459	0.012425	-2.290502	0.0220
T13	-0.048775	0.011650	-4.186541	0.0000
T14	-0.049325	0.011989	-4.114079	0.0000
T15	-0.053686	0.009154	-5.864948	0.0000
T16	-0.049943	0.009295	-5.373252	0.0000
T17	-0.041378	0.009473	-4.367883	0.0000
T18	-0.066624	0.010302	-6.467128	0.0000
T19	-0.039527	0.010592	-3.731671	0.0002
T20	-0.020473	0.011698	-1.750172	0.0801
T21	-0.041623	0.012969	-3.209526	0.0013
T22	-0.067357	0.013968	-4.822307	0.0000
T23	-0.059917	0.013070	-4.584271	0.0000
T24	-0.039207	0.012637	-3.102465	0.0019
T25	-0.004946	0.011889	-0.415992	0.6774
T26	0.046960	0.012882	3.645455	0.0003
T27	0.122759	0.012399	9.900710	0.0000

T28	0.158935	0.012738	12.47723	0.0000
T29	0.111644	0.016068	6.948191	0.0000
T30	0.104474	0.014191	7.362240	0.0000
T31	0.065552	0.014980	4.375942	0.0000
T32	0.045108	0.013925	3.239502	0.0012
T33	0.023975	0.014187	1.689981	0.0911
T34	0.020196	0.014878	1.357392	0.1747
T35	0.009175	0.015140	0.606018	0.5445
T36	-0.031564	0.015604	-2.022782	0.0431
T37	-0.096307	0.016395	-5.874231	0.0000
T38	-0.116666	0.016118	-7.238276	0.0000
T39	-0.081512	0.014664	-5.558528	0.0000
T40	-0.083663	0.015077	-5.548890	0.0000
T41	-0.094575	0.015882	-5.954786	0.0000
T42	-0.133469	0.016411	-8.132954	0.0000
T43	-0.190638	0.017045	-11.18426	0.0000
T44	-0.213973	0.016192	-13.21460	0.0000
T45	-0.251399	0.016056	-15.65718	0.0000
T46	-0.273361	0.016157	-16.91889	0.0000
T47	-0.259293	0.015518	-16.70919	0.0000
T48	-0.251464	0.015914	-15.80154	0.0000
T49	-0.261695	0.015729	-16.63809	0.0000
T50	-0.235692	0.015910	-14.81369	0.0000
T51	-0.269534	0.016697	-16.14272	0.0000
T52	-0.256687	0.016042	-16.00086	0.0000
T53	-0.244124	0.016234	-15.03765	0.0000
T54	-0.240658	0.016413	-14.66306	0.0000
T55	-0.245402	0.016872	-14.54482	0.0000
T56	-0.246021	0.016675	-14.75365	0.0000
T57	-0.245934	0.016628	-14.79018	0.0000
T58	-0.230590	0.016394	-14.06511	0.0000
T59	-0.210285	0.016186	-12.99163	0.0000
T60	-0.173576	0.016199	-10.71548	0.0000
T61	-0.129418	0.016173	-8.002207	0.0000
T62	-0.086119	0.016420	-5.244927	0.0000
T63	-0.023345	0.016226	-1.438789	0.1503
T64	0.012005	0.016521	0.726671	0.4675
T65	0.008676	0.016779	0.517057	0.6051
T66	0.051649	0.016628	3.106066	0.0019
T67	0.048830	0.017744	2.751997	0.0059
T68	-0.000829	0.017645	-0.047001	0.9625
T69	0.002435	0.017712	0.137463	0.8907
T70	0.034742	0.017820	1.949660	0.0513
T71	-0.049842	0.019400	-2.569138	0.0102
T72	-0.115381	0.019289	-5.981625	0.0000
T73	-0.182449	0.020806	-8.768974	0.0000
T74	-0.276360	0.018226	-15.16317	0.0000
T75	-0.229719	0.018125	-12.67412	0.0000
T76	-0.278526	0.019514	-14.27340	0.0000
T77	-0.330011	0.019494	-16.92865	0.0000

T78	-0.460952	0.020526	-22.45702	0.0000
T79	-0.525763	0.019961	-26.33972	0.0000
T80	-0.547598	0.020327	-26.93957	0.0000
T81	-0.609925	0.020351	-29.97059	0.0000
T82	-0.665947	0.019978	-33.33467	0.0000
T83	-0.594299	0.019677	-30.20240	0.0000
T84	-0.555164	0.020871	-26.60002	0.0000
T85	-0.549472	0.021505	-25.55037	0.0000
T86	-0.553853	0.022000	-25.17540	0.0000
T87	-0.554491	0.021853	-25.37328	0.0000
T88	-0.557208	0.021506	-25.90960	0.0000
T89	-0.544594	0.022026	-24.72454	0.0000
T90	-0.556554	0.023047	-24.14849	0.0000
T91	-0.563656	0.022781	-24.74193	0.0000
T92	-0.576662	0.023592	-24.44359	0.0000
T93	-0.611001	0.025349	-24.10391	0.0000
T94	-0.644478	0.024715	-26.07611	0.0000
T95	-0.652675	0.024708	-26.41582	0.0000
T96	-0.647438	0.024829	-26.07540	0.0000
T97	-0.655720	0.025284	-25.93377	0.0000
T98	-0.644854	0.025964	-24.83602	0.0000
T99	-0.635149	0.026187	-24.25428	0.0000
T100	-0.689555	0.028257	-24.40322	0.0000
T101	-0.732753	0.027576	-26.57256	0.0000
T102	-0.752973	0.028011	-26.88152	0.0000
T103	-0.757753	0.028324	-26.75342	0.0000
T104	-0.756673	0.028829	-26.24723	0.0000
T105	-0.754859	0.028998	-26.03173	0.0000
T106	-0.756683	0.030453	-24.84793	0.0000
T107	-0.778114	0.032494	-23.94607	0.0000
T108	-0.826299	0.031822	-25.96590	0.0000
T109	-0.813054	0.032717	-24.85140	0.0000
T110	-0.855284	0.032664	-26.18463	0.0000
T111	-0.826775	0.032699	-25.28439	0.0000
T112	-0.824163	0.033629	-24.50751	0.0000
T113	-0.858316	0.034250	-25.05999	0.0000
T114	-0.838049	0.035031	-23.92288	0.0000
T115	-0.856665	0.033445	-25.61437	0.0000
T116	-0.841972	0.030430	-27.66876	0.0000
T117	-0.870081	0.031104	-27.97360	0.0000
T118	-0.917024	0.028330	-32.36899	0.0000
T119	-0.886260	0.028198	-31.42936	0.0000
T120	-0.889694	0.028856	-30.83172	0.0000
T121	-0.905968	0.031978	-28.33132	0.0000
T122	-0.897855	0.034168	-26.27767	0.0000
T123	-0.910174	0.037182	-24.47873	0.0000
T124	-0.909562	0.039592	-22.97325	0.0000
T125	-0.950115	0.040255	-23.60244	0.0000
T126	-0.962967	0.042232	-22.80196	0.0000
T127	-0.949134	0.043575	-21.78139	0.0000

T128	-0.967968	0.046040	-21.02429	0.0000
T129	-1.012170	0.046095	-21.95825	0.0000
T130	-1.051642	0.046347	-22.69057	0.0000
T131	-1.056020	0.047335	-22.30964	0.0000
T132	-1.056353	0.048058	-21.98062	0.0000
T133	-1.078275	0.048807	-22.09241	0.0000
T134	-1.103151	0.050267	-21.94575	0.0000
T135	-1.144438	0.050853	-22.50463	0.0000
T136	-1.112994	0.051622	-21.56059	0.0000
T137	-1.118305	0.052380	-21.34995	0.0000
T138	-1.177886	0.053226	-22.12995	0.0000
T139	-1.140541	0.054246	-21.02526	0.0000
T140	-1.106340	0.055365	-19.98263	0.0000
T141	-1.111872	0.055882	-19.89679	0.0000
T142	-1.056240	0.056729	-18.61897	0.0000
T143	-1.015806	0.058026	-17.50600	0.0000
T144	-1.020394	0.059067	-17.27531	0.0000
T145	-0.969940	0.059891	-16.19509	0.0000
T146	-0.903852	0.060790	-14.86845	0.0000
T147	-0.849184	0.061683	-13.76683	0.0000
T148	-0.802861	0.063130	-12.71758	0.0000
T149	-0.813006	0.064049	-12.69351	0.0000
T150	-0.880349	0.056600	-15.55376	0.0000
T151	-0.851584	0.051218	-16.62667	0.0000
T152	-0.851576	0.050961	-16.71022	0.0000

R-squared	0.969784	Mean dependent var	3.496385
Adjusted R-squared	0.968934	S.D. dependent var	0.249866
S.E. of regression	0.044040	Akaike info criterion	-3.380302
Sum squared resid	11.38122	Schwarz criterion	-3.195838
Log likelihood	10364.37	F-statistic	1141.404
Durbin-Watson stat	1.973509	Prob(F-statistic)	0.000000

Appendix 16

Results of South Horizon in estimating equation 5

Dependent Variable: LOGDP
Method: Least Squares
Date: 03/09/05 Time: 16:06
Sample: 1 15927
Included observations: 15924
Excluded observations: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.146485	0.009688	324.7699	0.0000
AGE	2.26E-05	1.77E-06	12.82781	0.0000
AGE^2	-2.03E-09	5.18E-10	-3.916407	0.0001
FL	0.002005	0.000144	13.90811	0.0000
FL^2	-2.78E-05	3.54E-06	-7.848526	0.0000
GFA	0.000178	3.73E-06	47.80703	0.0000
GFA^2	-1.90E-08	7.69E-10	-24.69160	0.0000
LF	0.002729	0.001297	2.104579	0.0353
SV	0.010169	0.000953	10.67085	0.0000
FGV	-0.056437	0.002752	-20.50466	0.0000
PGV	-0.038508	0.003649	-10.55387	0.0000
PEAKXFGV	-0.024048	0.005471	-4.395932	0.0000
PEAKXPGV	-0.020624	0.007096	-2.906252	0.0037
BOTTOMXFGV	-0.003581	0.009043	-0.395986	0.6921
BOTTOMXPGV	-0.002603	0.013852	-0.187903	0.8510
T2	0.010578	0.012023	0.879785	0.3790
T3	0.046547	0.009364	4.970791	0.0000
T4	0.076116	0.010488	7.257613	0.0000
T5	0.093798	0.011271	8.321861	0.0000
T6	0.129311	0.012384	10.44198	0.0000
T7	0.113110	0.011384	9.936027	0.0000
T8	0.151269	0.009710	15.57864	0.0000
T9	0.151427	0.009763	15.51010	0.0000
T10	0.125440	0.013502	9.290464	0.0000
T11	0.101943	0.013105	7.779112	0.0000
T12	0.040286	0.011903	3.384544	0.0007
T13	0.061792	0.009664	6.394211	0.0000
T14	0.062607	0.011036	5.673123	0.0000
T15	0.079008	0.009900	7.980369	0.0000
T16	0.093419	0.009374	9.965195	0.0000
T17	0.124219	0.009327	13.31854	0.0000
T18	0.162848	0.009725	16.74570	0.0000
T19	0.222465	0.010200	21.80957	0.0000
T20	0.258211	0.011789	21.90218	0.0000
T21	0.242044	0.012755	18.97634	0.0000
T22	0.229242	0.012761	17.96411	0.0000
T23	0.246079	0.011212	21.94819	0.0000
T24	0.280099	0.010668	26.25688	0.0000

T25	0.348148	0.010146	34.31221	0.0000
T26	0.428312	0.011152	38.40597	0.0000
T27	0.510276	0.010202	50.01642	0.0000
T28	0.547879	0.009827	55.75081	0.0000
T29	0.464853	0.013102	35.47904	0.0000
T30	0.489887	0.010864	45.09273	0.0000
T31	0.460924	0.009923	46.44932	0.0000
T32	0.452872	0.010044	45.08683	0.0000
T33	0.460327	0.010201	45.12495	0.0000
T34	0.451548	0.010775	41.90522	0.0000
T35	0.449851	0.011163	40.30003	0.0000
T36	0.400926	0.013120	30.55803	0.0000
T37	0.361829	0.012419	29.13511	0.0000
T38	0.340935	0.011881	28.69533	0.0000
T39	0.370898	0.009308	39.84802	0.0000
T40	0.391340	0.009409	41.59138	0.0000
T41	0.381102	0.011291	33.75288	0.0000
T42	0.341249	0.011577	29.47702	0.0000
T43	0.316426	0.012278	25.77245	0.0000
T44	0.304057	0.012011	25.31459	0.0000
T45	0.275591	0.011642	23.67273	0.0000
T46	0.254467	0.010144	25.08664	0.0000
T47	0.269074	0.010032	26.82236	0.0000
T48	0.283553	0.010584	26.79105	0.0000
T49	0.274584	0.010178	26.97857	0.0000
T50	0.323813	0.009901	32.70635	0.0000
T51	0.361975	0.010464	34.59120	0.0000
T52	0.378185	0.010201	37.07390	0.0000
T53	0.400994	0.010272	39.03838	0.0000
T54	0.407409	0.010435	39.04080	0.0000
T55	0.417729	0.010397	40.17797	0.0000
T56	0.412689	0.010859	38.00287	0.0000
T57	0.424864	0.010478	40.54650	0.0000
T58	0.445544	0.009923	44.90189	0.0000
T59	0.483073	0.009757	49.51256	0.0000
T60	0.530898	0.009845	53.92493	0.0000
T61	0.574404	0.010076	57.00915	0.0000
T62	0.622823	0.010030	62.09387	0.0000
T63	0.692650	0.009639	71.85713	0.0000
T64	0.707821	0.010480	67.54262	0.0000
T65	0.696162	0.009713	71.67409	0.0000
T66	0.748847	0.009698	77.21840	0.0000
T67	0.752136	0.010768	69.85115	0.0000
T68	0.722556	0.010393	69.52496	0.0000
T69	0.743710	0.010590	70.22807	0.0000
T70	0.761560	0.010384	73.33795	0.0000
T71	0.664396	0.011554	57.50229	0.0000
T72	0.619247	0.010475	59.11550	0.0000
T73	0.555577	0.012680	43.81403	0.0000
T74	0.479426	0.010596	45.24394	0.0000

T75	0.518728	0.010533	49.24742	0.0000
T76	0.483041	0.010903	44.30517	0.0000
T77	0.460184	0.011695	39.35013	0.0000
T78	0.299964	0.011321	26.49594	0.0000
T79	0.260037	0.010711	24.27813	0.0000
T80	0.208238	0.011690	17.81267	0.0000
T81	0.140644	0.010960	12.83300	0.0000
T82	0.129258	0.010804	11.96426	0.0000
T83	0.212148	0.010394	20.41148	0.0000
T84	0.255495	0.011524	22.17044	0.0000
T85	0.251976	0.012426	20.27831	0.0000
T86	0.251513	0.012599	19.96366	0.0000
T87	0.254120	0.010898	23.31885	0.0000
T88	0.267425	0.011207	23.86334	0.0000
T89	0.287267	0.011485	25.01152	0.0000
T90	0.274172	0.012745	21.51298	0.0000
T91	0.271681	0.011987	22.66525	0.0000
T92	0.259150	0.012031	21.54008	0.0000
T93	0.212660	0.012821	16.58668	0.0000
T94	0.202332	0.012351	16.38187	0.0000
T95	0.160989	0.011822	13.61725	0.0000
T96	0.191152	0.011263	16.97201	0.0000
T97	0.189911	0.011930	15.91878	0.0000
T98	0.199677	0.012452	16.03616	0.0000
T99	0.212667	0.012185	17.45383	0.0000
T100	0.206416	0.012739	16.20329	0.0000
T101	0.143387	0.013359	10.73343	0.0000
T102	0.089355	0.012303	7.262996	0.0000
T103	0.090601	0.011635	7.787147	0.0000
T104	0.102302	0.011749	8.707611	0.0000
T105	0.122138	0.012249	9.971203	0.0000
T106	0.115473	0.012989	8.890064	0.0000
T107	0.094075	0.013533	6.951691	0.0000
T108	0.062061	0.013347	4.649682	0.0000
T109	0.002439	0.013087	0.186360	0.8522
T110	0.042636	0.012745	3.345205	0.0008
T111	0.070910	0.011275	6.289022	0.0000
T112	0.069329	0.013615	5.092204	0.0000
T113	0.026320	0.011935	2.205365	0.0274
T114	0.008567	0.011982	0.714979	0.4746
T115	0.028194	0.012362	2.280736	0.0226
T116	0.021416	0.012101	1.769838	0.0768
T117	-0.023882	0.012815	-1.863627	0.0624
T118	-0.052945	0.011829	-4.475902	0.0000
T119	-0.050413	0.011982	-4.207252	0.0000
T120	-0.040256	0.011908	-3.380496	0.0007
T121	-0.033772	0.011693	-2.888165	0.0039
T122	-0.072743	0.015113	-4.813297	0.0000
T123	-0.046074	0.012838	-3.588792	0.0003
T124	-0.055340	0.012683	-4.363354	0.0000

T125	-0.065593	0.012713	-5.159601	0.0000
T126	-0.052106	0.012798	-4.071507	0.0000
T127	-0.077296	0.013655	-5.660620	0.0000
T128	-0.116224	0.014090	-8.248832	0.0000
T129	-0.121297	0.015245	-7.956588	0.0000
T130	-0.143057	0.012710	-11.25519	0.0000
T131	-0.168072	0.013095	-12.83482	0.0000
T132	-0.168948	0.013449	-12.56254	0.0000
T133	-0.200214	0.012983	-15.42178	0.0000
T134	-0.250996	0.014489	-17.32370	0.0000
T135	-0.274681	0.013391	-20.51169	0.0000
T136	-0.249609	0.013740	-18.16638	0.0000
T137	-0.274466	0.012733	-21.55491	0.0000
T138	-0.264785	0.012532	-21.12896	0.0000
T139	-0.264167	0.012562	-21.02924	0.0000
T140	-0.240790	0.012235	-19.68013	0.0000
T141	-0.211460	0.012110	-17.46117	0.0000
T142	-0.158325	0.013177	-12.01530	0.0000
T143	-0.117446	0.013794	-8.514024	0.0000
T144	-0.101911	0.013463	-7.569972	0.0000
T145	-0.046307	0.012239	-3.783564	0.0002
T146	0.011174	0.013041	0.856861	0.3915
T147	0.059020	0.012476	4.730552	0.0000
T148	0.090436	0.013410	6.743897	0.0000
T149	0.049673	0.015222	3.263211	0.0011
T150	-0.003516	0.013829	-0.254220	0.7993
T151	0.054661	0.014748	3.706365	0.0002
T152	0.023151	0.015594	1.484673	0.1377
R-squared	0.958996			
atistic	.617			
Durbin-Watson stat	1.798829			

Appendix 17

Results of Riviera Garden in estimating equation 6

Dependent Variable: LOGNP
Method: Least Squares
Included observations: 6034

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.477894	0.034958	99.48654	0.0000
AGE	0.000204	2.40E-05	8.478020	0.0000
AGE^2	-2.03E-08	5.23E-09	-3.875234	0.0001
FL	0.002843	0.000205	13.90222	0.0000
FL^2	-4.84E-05	5.24E-06	-9.250285	0.0000
GFA	-0.000882	9.13E-05	-9.660686	0.0000
GFA^2	7.60E-07	6.77E-08	11.22314	0.0000
LF	0.001620	0.001909	0.848618	0.3961
SV	0.037337	0.001468	25.43382	0.0000
FGV	-0.027409	0.001849	-14.82577	0.0000
PGV	-0.003914	0.006241	-0.627237	0.5305
PEAKXFGV	-0.010501	0.003477	-3.020451	0.0025
PEAKXPGV	-0.019859	0.012005	-1.654249	0.0981
BOTTOMXFGV	-0.002574	0.006766	-0.380505	0.7036
BOTTOMXPGV	0.003862	0.023453	0.164653	0.8692
T2	0.003122	0.007563	0.412855	0.6797
T3	0.016895	0.006368	2.653164	0.0080
T4	0.024663	0.007329	3.365018	0.0008
T5	0.028101	0.007561	3.716464	0.0002
T6	0.029423	0.007469	3.939582	0.0001
T7	0.030282	0.007607	3.980978	0.0001
T8	0.015054	0.008831	1.704647	0.0883
T9	0.030768	0.013002	2.366337	0.0180
T10	0.012779	0.010519	1.214842	0.2245
T11	-0.003939	0.011979	-0.328804	0.7423
T12	-0.020031	0.012392	-1.616462	0.1060
T13	-0.027448	0.011620	-2.362190	0.0182
T14	-0.030142	0.011958	-2.520659	0.0117
T15	-0.033460	0.009130	-3.664894	0.0002
T16	-0.035927	0.009270	-3.875424	0.0001
T17	-0.030514	0.009448	-3.229554	0.0012
T18	-0.048251	0.010275	-4.695944	0.0000
T19	-0.041296	0.010565	-3.908875	0.0001
T20	-0.030064	0.011667	-2.576845	0.0100
T21	-0.041818	0.012935	-3.233012	0.0012
T22	-0.055151	0.013931	-3.958883	0.0001
T23	-0.048440	0.013036	-3.715961	0.0002
T24	-0.036584	0.012604	-2.902522	0.0037
T25	-0.027371	0.011858	-2.308271	0.0210
T26	-0.008506	0.012848	-0.662089	0.5079
T27	0.040003	0.012366	3.234778	0.0012

T28	0.062213	0.012705	4.896944	0.0000
T29	0.040985	0.016026	2.557463	0.0106
T30	0.042206	0.014153	2.982062	0.0029
T31	0.029009	0.014941	1.941592	0.0522
T32	0.016100	0.013888	1.159256	0.2464
T33	0.006547	0.014150	0.462700	0.6436
T34	0.005588	0.014839	0.376574	0.7065
T35	-0.001705	0.015100	-0.112894	0.9101
T36	-0.022077	0.015563	-1.418550	0.1561
T37	-0.054468	0.016352	-3.330990	0.0009
T38	-0.064192	0.016076	-3.993170	0.0001
T39	-0.045932	0.014626	-3.140489	0.0017
T40	-0.047946	0.015038	-3.188385	0.0014
T41	-0.047187	0.015840	-2.978888	0.0029
T42	-0.064514	0.016368	-3.941496	0.0001
T43	-0.102920	0.017000	-6.053962	0.0000
T44	-0.110596	0.016150	-6.848183	0.0000
T45	-0.128835	0.016014	-8.044993	0.0000
T46	-0.140151	0.016115	-8.697110	0.0000
T47	-0.134410	0.015477	-8.684376	0.0000
T48	-0.128260	0.015872	-8.080830	0.0000
T49	-0.130216	0.015687	-8.300682	0.0000
T50	-0.123794	0.015869	-7.801203	0.0000
T51	-0.137524	0.016653	-8.258168	0.0000
T52	-0.124060	0.016000	-7.753762	0.0000
T53	-0.121682	0.016192	-7.515142	0.0000
T54	-0.117386	0.016369	-7.171078	0.0000
T55	-0.121690	0.016828	-7.231470	0.0000
T56	-0.118519	0.016631	-7.126161	0.0000
T57	-0.119944	0.016585	-7.232291	0.0000
T58	-0.113877	0.016351	-6.964339	0.0000
T59	-0.110326	0.016144	-6.833978	0.0000
T60	-0.095580	0.016156	-5.916026	0.0000
T61	-0.067699	0.016130	-4.197018	0.0000
T62	-0.043572	0.016376	-2.660643	0.0078
T63	-0.009808	0.016183	-0.606080	0.5445
T64	0.016909	0.016477	1.026195	0.3048
T65	0.016072	0.016735	0.960382	0.3369
T66	0.036205	0.016585	2.183046	0.0291
T67	0.036234	0.017697	2.047486	0.0407
T68	-0.004671	0.017599	-0.265410	0.7907
T69	-0.002509	0.017665	-0.142036	0.8871
T70	0.025767	0.017773	1.449784	0.1472
T71	-0.015372	0.019349	-0.794459	0.4270
T72	-0.055321	0.019239	-2.875526	0.0040
T73	-0.086347	0.020752	-4.160981	0.0000
T74	-0.134702	0.018178	-7.410223	0.0000
T75	-0.106473	0.018077	-5.889814	0.0000
T76	-0.136689	0.019462	-7.023241	0.0000
T77	-0.167933	0.019443	-8.637182	0.0000

T78	-0.220520	0.020472	-10.77173	0.0000
T79	-0.258388	0.019908	-12.97882	0.0000
T80	-0.261778	0.020274	-12.91231	0.0000
T81	-0.290054	0.020297	-14.29024	0.0000
T82	-0.325872	0.019925	-16.35480	0.0000
T83	-0.290405	0.019626	-14.79729	0.0000
T84	-0.271213	0.020816	-13.02907	0.0000
T85	-0.266653	0.021449	-12.43198	0.0000
T86	-0.267592	0.021942	-12.19542	0.0000
T87	-0.267215	0.021796	-12.25986	0.0000
T88	-0.277209	0.021449	-12.92390	0.0000
T89	-0.271188	0.021969	-12.34433	0.0000
T90	-0.275324	0.022987	-11.97759	0.0000
T91	-0.277498	0.022722	-12.21298	0.0000
T92	-0.286313	0.023530	-12.16821	0.0000
T93	-0.299207	0.025282	-11.83475	0.0000
T94	-0.327960	0.024650	-13.30448	0.0000
T95	-0.319512	0.024643	-12.96568	0.0000
T96	-0.324459	0.024764	-13.10189	0.0000
T97	-0.337522	0.025218	-13.38419	0.0000
T98	-0.326188	0.025896	-12.59595	0.0000
T99	-0.312601	0.026118	-11.96863	0.0000
T100	-0.359593	0.028183	-12.75944	0.0000
T101	-0.377738	0.027503	-13.73437	0.0000
T102	-0.371774	0.027937	-13.30748	0.0000
T103	-0.375250	0.028249	-13.28356	0.0000
T104	-0.377408	0.028753	-13.12587	0.0000
T105	-0.376733	0.028921	-13.02605	0.0000
T106	-0.378301	0.030373	-12.45534	0.0000
T107	-0.384178	0.032409	-11.85401	0.0000
T108	-0.418598	0.031739	-13.18881	0.0000
T109	-0.392563	0.032631	-12.03049	0.0000
T110	-0.430756	0.032578	-13.22239	0.0000
T111	-0.417904	0.032613	-12.81396	0.0000
T112	-0.409213	0.033541	-12.20049	0.0000
T113	-0.431644	0.034160	-12.63576	0.0000
T114	-0.409334	0.034939	-11.71559	0.0000
T115	-0.423673	0.033357	-12.70123	0.0000
T116	-0.410703	0.030350	-13.53201	0.0000
T117	-0.430282	0.031022	-13.87024	0.0000
T118	-0.466049	0.028256	-16.49386	0.0000
T119	-0.431865	0.028124	-15.35552	0.0000
T120	-0.432936	0.028781	-15.04259	0.0000
T121	-0.445114	0.031894	-13.95621	0.0000
T122	-0.436946	0.034078	-12.82184	0.0000
T123	-0.443242	0.037085	-11.95220	0.0000
T124	-0.436193	0.039488	-11.04615	0.0000
T125	-0.474184	0.040149	-11.81053	0.0000
T126	-0.486933	0.042121	-11.56038	0.0000
T127	-0.462147	0.043461	-10.63361	0.0000

T128	-0.470198	0.045920	-10.23960	0.0000
T129	-0.504204	0.045974	-10.96712	0.0000
T130	-0.534072	0.046225	-11.55365	0.0000
T131	-0.527795	0.047210	-11.17964	0.0000
T132	-0.530279	0.047932	-11.06311	0.0000
T133	-0.547555	0.048679	-11.24820	0.0000
T134	-0.563980	0.050135	-11.24919	0.0000
T135	-0.593540	0.050720	-11.70231	0.0000
T136	-0.552513	0.051486	-10.73130	0.0000
T137	-0.545595	0.052242	-10.44357	0.0000
T138	-0.605289	0.053086	-11.40202	0.0000
T139	-0.573021	0.054104	-10.59114	0.0000
T140	-0.543937	0.055220	-9.850424	0.0000
T141	-0.564902	0.055735	-10.13545	0.0000
T142	-0.534658	0.056580	-9.449556	0.0000
T143	-0.505504	0.057874	-8.734593	0.0000
T144	-0.521901	0.058911	-8.859070	0.0000
T145	-0.496358	0.059734	-8.309506	0.0000
T146	-0.464017	0.060630	-7.653217	0.0000
T147	-0.440687	0.061521	-7.163156	0.0000
T148	-0.409641	0.062964	-6.505932	0.0000
T149	-0.417435	0.063881	-6.534592	0.0000
T150	-0.472612	0.056452	-8.371962	0.0000
T151	-0.435541	0.051083	-8.526079	0.0000
T152	-0.439024	0.050828	-8.637525	0.0000

R-squared	0.901229	Mean dependent var	3.511070
Adjusted R-squared	0.898452	S.D. dependent var	0.137839
S.E. of regression	0.043925	Akaike info criterion	-3.385561
Sum squared resid	11.32152	Schwarz criterion	-3.201097
Log likelihood	10380.24	F-statistic	324.4987
Durbin-Watson stat	1.980581	Prob(F-statistic)	0.000000

Appendix 18

Results of South Horizon in estimating equation 6

Dependent Variable: LOGNP
Method: Least Squares
Date: 03/09/05 Time: 16:14
Sample: 1 15927
Included observations: 15924
Excluded observations: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.281724	0.009525	344.5541	0.0000
AGE	2.15E-05	1.74E-06	12.38274	0.0000
AGE^2	-1.86E-09	5.09E-10	-3.652073	0.0003
FL	0.002000	0.000142	14.11187	0.0000
FL^2	-2.76E-05	3.48E-06	-7.953773	0.0000
GFA	0.000179	3.67E-06	48.79821	0.0000
GFA^2	-1.91E-08	7.56E-10	-25.20614	0.0000
LF	0.002899	0.001275	2.273618	0.0230
SV	0.010123	0.000937	10.80513	0.0000
FGV	-0.055617	0.002706	-20.55399	0.0000
PGV	-0.037416	0.003587	-10.43110	0.0000
PEAKXFGV	-0.024930	0.005378	-4.635438	0.0000
PEAKXPGV	-0.021857	0.006976	-3.132955	0.0017
BOTTOMXFGV	-0.004458	0.008890	-0.501447	0.6161
BOTTOMXPGV	-0.003781	0.013618	-0.277624	0.7813
T2	0.030899	0.011820	2.614206	0.0090
T3	0.045160	0.009206	4.905647	0.0000
T4	0.053607	0.010310	5.199355	0.0000
T5	0.055343	0.011081	4.994525	0.0000
T6	0.080220	0.012174	6.589225	0.0000
T7	0.061816	0.011191	5.523536	0.0000
T8	0.100183	0.009546	10.49489	0.0000
T9	0.105161	0.009598	10.95648	0.0000
T10	0.090364	0.013274	6.807728	0.0000
T11	0.070737	0.012883	5.490667	0.0000
T12	0.023309	0.011702	1.991893	0.0464
T13	0.051889	0.009500	5.461723	0.0000
T14	0.045688	0.010849	4.211219	0.0000
T15	0.057045	0.009733	5.861020	0.0000
T16	0.058737	0.009216	6.373378	0.0000
T17	0.081313	0.009169	8.868198	0.0000
T18	0.094633	0.009560	9.898543	0.0000
T19	0.124516	0.010028	12.41693	0.0000
T20	0.147256	0.011590	12.70542	0.0000
T21	0.134867	0.012539	10.75545	0.0000
T22	0.129126	0.012545	10.29279	0.0000
T23	0.140322	0.011022	12.73078	0.0000
T24	0.160618	0.010487	15.31552	0.0000

T25	0.198006	0.009975	19.85035	0.0000
T26	0.240931	0.010964	21.97540	0.0000
T27	0.290721	0.010030	28.98604	0.0000
T28	0.309329	0.009661	32.01789	0.0000
T29	0.247802	0.012881	19.23831	0.0000
T30	0.276783	0.010680	25.91525	0.0000
T31	0.267907	0.009755	27.46242	0.0000
T32	0.260832	0.009875	26.41443	0.0000
T33	0.268353	0.010029	26.75851	0.0000
T34	0.257939	0.010593	24.34931	0.0000
T35	0.255486	0.010974	23.28136	0.0000
T36	0.221381	0.012898	17.16348	0.0000
T37	0.210592	0.012209	17.24889	0.0000
T38	0.196078	0.011680	16.78707	0.0000
T39	0.205492	0.009150	22.45700	0.0000
T40	0.221099	0.009250	23.90239	0.0000
T41	0.218996	0.011100	19.72929	0.0000
T42	0.195929	0.011381	17.21534	0.0000
T43	0.186355	0.012070	15.43934	0.0000
T44	0.185565	0.011808	15.71516	0.0000
T45	0.171803	0.011445	15.01137	0.0000
T46	0.157483	0.009972	15.79250	0.0000
T47	0.159524	0.009862	16.17543	0.0000
T48	0.168749	0.010405	16.21818	0.0000
T49	0.163925	0.010006	16.38299	0.0000
T50	0.190309	0.009733	19.55250	0.0000
T51	0.210596	0.010287	20.47119	0.0000
T52	0.221791	0.010028	22.11636	0.0000
T53	0.231200	0.010098	22.89533	0.0000
T54	0.235233	0.010259	22.92933	0.0000
T55	0.242814	0.010221	23.75598	0.0000
T56	0.237824	0.010676	22.27688	0.0000
T57	0.245315	0.010301	23.81401	0.0000
T58	0.254022	0.009755	26.04062	0.0000
T59	0.271512	0.009592	28.30727	0.0000
T60	0.294600	0.009679	30.43807	0.0000
T61	0.318683	0.009905	32.17293	0.0000
T62	0.345013	0.009861	34.98842	0.0000
T63	0.383284	0.009476	40.44658	0.0000
T64	0.387281	0.010302	37.59121	0.0000
T65	0.380619	0.009549	39.86095	0.0000
T66	0.405654	0.009534	42.54889	0.0000
T67	0.405322	0.010586	38.28971	0.0000
T68	0.381651	0.010217	37.35433	0.0000
T69	0.399067	0.010411	38.33169	0.0000
T70	0.409948	0.010209	40.15676	0.0000
T71	0.354277	0.011359	31.18930	0.0000
T72	0.331682	0.010298	32.20806	0.0000
T73	0.304579	0.012466	24.43288	0.0000
T74	0.268195	0.010417	25.74513	0.0000

T75	0.287577	0.010355	27.77178	0.0000
T76	0.267773	0.010718	24.98285	0.0000
T77	0.263065	0.011497	22.88145	0.0000
T78	0.178516	0.011130	16.03961	0.0000
T79	0.162496	0.010530	15.43227	0.0000
T80	0.127614	0.011493	11.10388	0.0000
T81	0.092111	0.010774	8.549103	0.0000
T82	0.098661	0.010621	9.289231	0.0000
T83	0.143485	0.010218	14.04260	0.0000
T84	0.164721	0.011329	14.53935	0.0000
T85	0.157835	0.012216	12.92060	0.0000
T86	0.159347	0.012386	12.86554	0.0000
T87	0.160494	0.010713	14.98070	0.0000
T88	0.164915	0.011017	14.96910	0.0000
T89	0.176433	0.011291	15.62570	0.0000
T90	0.169017	0.012529	13.49000	0.0000
T91	0.170085	0.011784	14.43352	0.0000
T92	0.159935	0.011828	13.52211	0.0000
T93	0.133246	0.012604	10.57137	0.0000
T94	0.125879	0.012142	10.36706	0.0000
T95	0.099620	0.011623	8.571283	0.0000
T96	0.118117	0.011072	10.66773	0.0000
T97	0.110512	0.011728	9.422691	0.0000
T98	0.119319	0.012241	9.747387	0.0000
T99	0.134678	0.011979	11.24328	0.0000
T100	0.134449	0.012524	10.73555	0.0000
T101	0.095146	0.013133	7.244736	0.0000
T102	0.066174	0.012095	5.471298	0.0000
T103	0.067404	0.011438	5.893008	0.0000
T104	0.074630	0.011550	6.461530	0.0000
T105	0.092200	0.012042	7.656586	0.0000
T106	0.084564	0.012769	6.622454	0.0000
T107	0.077718	0.013304	5.841798	0.0000
T108	0.058458	0.013122	4.455032	0.0000
T109	0.010606	0.012866	0.824342	0.4098
T110	0.053921	0.012530	4.303321	0.0000
T111	0.065524	0.011085	5.911306	0.0000
T112	0.069220	0.013385	5.171600	0.0000
T113	0.036979	0.011733	3.151777	0.0016
T114	0.020435	0.011779	1.734861	0.0828
T115	0.046805	0.012153	3.851410	0.0001
T116	0.042532	0.011896	3.575295	0.0004
T117	0.006640	0.012598	0.527079	0.5981
T118	-0.004941	0.011629	-0.424929	0.6709
T119	-0.000416	0.011780	-0.035291	0.9718
T120	0.011028	0.011707	0.942009	0.3462
T121	0.014868	0.011496	1.293351	0.1959
T122	-0.025985	0.014857	-1.748939	0.0803
T123	0.001983	0.012621	0.157100	0.8752
T124	-0.002721	0.012468	-0.218271	0.8272

T125	-0.010947	0.012498	-0.875905	0.3811
T126	0.001875	0.012581	0.148999	0.8816
T127	-0.013103	0.013424	-0.976097	0.3290
T128	-0.041596	0.013852	-3.002983	0.0027
T129	-0.036719	0.014987	-2.450034	0.0143
T130	-0.049094	0.012495	-3.928967	0.0001
T131	-0.063666	0.012874	-4.945438	0.0000
T132	-0.066835	0.013221	-5.055133	0.0000
T133	-0.093591	0.012763	-7.332933	0.0000
T134	-0.135985	0.014244	-9.547060	0.0000
T135	-0.147946	0.013165	-11.23782	0.0000
T136	-0.113272	0.013508	-8.385626	0.0000
T137	-0.125834	0.012518	-10.05222	0.0000
T138	-0.116164	0.012320	-9.428922	0.0000
T139	-0.120516	0.012349	-9.758797	0.0000
T140	-0.102051	0.012028	-8.484241	0.0000
T141	-0.087888	0.011906	-7.382127	0.0000
T142	-0.059950	0.012954	-4.627866	0.0000
T143	-0.030055	0.013561	-2.216213	0.0267
T144	-0.025934	0.013235	-1.959525	0.0501
T145	0.004973	0.012032	0.413304	0.6794
T146	0.029252	0.012821	2.281592	0.0225
T147	0.046091	0.012265	3.757774	0.0002
T148	0.062900	0.013183	4.771186	0.0000
T149	0.024795	0.014965	1.656882	0.0976
T150	-0.018114	0.013596	-1.332372	0.1828
T151	0.046308	0.014498	3.193975	0.0014
T152	0.011413	0.015330	0.744478	0.4566

R-squared	0.872116	Mean dependent var	3.623055
F-statistic	651.2896	S.D. dependent var	0.132575
Durbin-Watson stat	1.840063	Prob(F-statistic)	0.000000